

SP DNO 11/94: **A Beginners Guide To Working Satellites**

# amateur radio action

October 1994

Oceania's Amateur Magazine

\$3.95\*

“...the world's  
first handheld  
SSB/CW  
tri-bander”

plus

- Latest DXCC Country list
- Receiving weather satellite images
- Columns on DX info, SWL, UHF, VHF

....and lots more

TM-733A “...a complex new dual-band FM transceiver”



PP349034/00018

ISSN 0156-7071



10

9 770156 707009



# KENWOOD



## WAY OUT AHEAD!

### For People on the Move

It's like six transceivers in one! Kenwood's new TM-733A is an FM dual-band (144MHz/430MHz) transceiver with a difference: six entire operating profiles can be stored in a unique programmable memory, ready for instant recall. As well as receiving simultaneously on VHF and UHF bands, the TM-733A can receive two frequencies on the same band (VHF+VHF or UHF+UHF). You also get 72 memory channels, built-in DTSS and pager functions, AIP, and a data connector for 1200/9600 baud packet communications. And, for greater convenience, the detachable front panel has a high-visibility LCD with key function display. Check out Kenwood's TM-733A — a sensational solution to the hassles of mobile communications.

- Max. 50W output (144MHz), 35W (430MHz) ■ 72 memory channels ■ Dual receive on same band
- Built-in DTSS with pager ■ Multi-scan functions plus TO & CO scan stop modes
- Auto simplex checker ■ Built-in CTCSS encoder & optional TSU-8 decoder ■ Automatic band change
- AIP (Advanced Intercept Point) ■ Selectable frequency step ■ Incremental MHz key
- S-meter squelch ■ Audible frequency identification ■ Separate speaker terminals for each band
- Auto repeater offset (144MHz) ■ Repeater reverse switch & offset switch ■ 1200/9600 baud packet terminal

### KENWOOD ELECTRONICS AUSTRALIA PTY. LTD.

(INCORPORATED IN N.S.W.)

8 Figtree Drive, Australia Centre, Homebush, N.S.W. 2140  
 Phone (02) 746 1519, (02) 746 1888, Fax (02) 746 1509  
 Interstate Toll Free 1800-656-352  
 Call now for further information and the name of your  
 nearest authorised Kenwood dealer.

Kenwood Electronics Australia Pty Ltd only warrants products  
 purchased from their authorised Australia dealers.

## FM DUAL BANDER **TM-733A**



# amateur. radio action

October Issue - Vol 17 No 9

On Sale: 21 September, 1994

## Special Features

- 10 EQUIPMENT REVIEW:** Kenwood's new TM-733A dual-bander is a good unit - but complex to operate- Chris Edmondson, VK3CE.
- 15 AMSAT WHO...?:** A one page look at the AMSAT operation.
- 16 SATELLITES FOR BEGINNERS:** A "primer" on how and where to start on this exciting aspect of amateur radio, by Stephen Holmstead, N7TQL.
- 24 HERE and THERE:** Paul Butler, VK3DBP, checks out the "Electronic Workbench" software and wonders how a "Continuous Travelling Wave" antenna works...
- 33 DXCC COUNTRY LIST:** An updated "different" DXCC listing from Bill Brelsford, K2DI.
- 40 EQUIPMENT REVIEW:** Tokyo Hy-Power's tri-band HT-750 is like no other - covering segments of 40, 15 and six metres with SSB and semi break-in CW...Greg Towells, VK2GJT.
- 50 WEATHER SATELLITES:** Arthur Andrews, VK2AAE, continues his series on weather sats and remote imaging.

**IN THE NEXT ISSUE (maybe):** It's a difficult job to predict what each upcoming issue will contain - but we keep on trying... The certainties include reviews on Icom's IC-738 and Alinco's DJ180T; a great guide to medium/high-speed packet operation; a look at Andy Coman's antenna operation; a review on the Windom antenna...and a lot more yet to be decided.

**DISCLAIMER:** While all contributed material is read and checked as to its correctness, it is not possible to physically build and check every technical/project/modification article that appears in ARA. In consequence, we suggest that you use due care, be aware that most modifications will void a manufacturer's warranty, and that ARA accepts no responsibility for the small puff of black smoke which may be emitted from equipment at any time and for any reason.

Closing date for editorial contributions, club news, etc. - 4 October

## Regular Features

- 5—NEWCOMERS START HERE**
- 6—WORLD NEWSDESK:** Things you might like to know.
- 22—FEEDBACK:** You have your say...
- 27—GONE TROPO:** VHF/UHF news from Chris Davis, VK1DO.
- 44—DX & BAND:** HF DX and IOTA news from Jim Smith, VK9NS.
- 48—PROPAGATION:** IPS looks at the likely HF propagation (or lack of it) for October.
- 54—DX UPDATE:** The latest on the DX scene.
- 57—SHORTWAVE:** Craig Seager brings you up to date on short wave news.
- 60—VHF and THEREABOUTS:** Steve Gregory, VK3OT, talks about VHF in general.
- 63—CLASSIFIEDS:** Great DEAL\$!!
- 66—ADVERTISE FREE** in ARA.





# STUPENDOUS 420MB HD SYSTEM OFFER. DON'T MISS OUT! 486DX2-66 MULTIMEDIA SYSTEM



**LATEST TECHNOLOGY PENTIUM UPGRADABLE MOTHERBOARD SUPPLIED**  
This is a true 486 machine, not a 486SX machine sold by "The Big Stores". What you get from our system is the latest technology and the most complete bundle you will ever find. Don't settle for anything less than fast graphics & superb sound system! 486DX4-100, Pentium 60/66 upgradable motherboard fitted.

## HARDWARE CONFIGURATION:

- ◆ VESA LOCAL BUS components, including: I/O Card, True S3 1 MEG Video Accelerator Card & Motherboard.
- ◆ 4MB of SIMM RAM exp to 128MB
- ◆ 420MB Hard Disk Drive
- ◆ 1.44 Floppy Disk Drive
- ◆ 14" Supra VGA Monitor-1024 x 768 resolution
- ◆ Midi Tower Case with 200W Power Supply
- ◆ The popular Microsoft Ergonomic Mouse
- ◆ Chicory high quality keyboard
- ◆ 2 high speed serial ports fitted on VESA I/O cards

## MULTIMEDIA ENTERTAINMENT:

- ◆ Internal Double Speed Photo CD, CD ROM drive which will play the latest video software.
- ◆ 16 Bit Sound Card (Sound Blaster compatible)
- ◆ Magnetically shielded Speakers
- ◆ Joystick for those shoot-em-up games

## TO GET YOU UP AND RUNNING:

- ◆ DOS 6.22 & Windows 3.11 all preinstalled.
- ◆ Microsoft Works for Windows\*

## UPGRADABILITY:

- ◆ Comes with a ready to go 256K Cache Pentium 60 or 66 motherboard. Don't buy old technology you can't upgrade!

USE YOUR DINERS CLUB/AMEX CARDS TO GAIN FLYER POINTS! APPLYS TO THIS MULTIMEDIA SYSTEM PRODUCT OFFER ONLY.

## SOFTWARE BONUS EXTRAS!!

**Microsoft Bookshelf CD** - Packed with animation, illustration, sound and lightning-fast search capabilities. A CD-ROM reference library to the Concise Columbia Encyclopedia, Electronic Thesaurus, World Almanac and book of facts, Hammond Atlas, The American Heritage Dictionary, Bartlett's Familiar Quotations & The Concise Columbia Dictionary of Quotations.

**Phonedisc** - The latest in Australian Directory Assistance. Allow you to find virtually any business numbers in Australia, including Fax Numbers.

**4 YEARS PARTS & LABOUR WARRANTY** **ATTENTION!!**

This system is designed to cater for HIGH SPEED GRAPHICS and CD ROM, especially the latest Video Software. Buying anything less will mean that you will miss out on the latest Video on PC revolution.

## MOTHERBOARDS

|   |        |
|---|--------|
| 386SX-40* LM 47   | \$129  |
| 386DX-40* 8K Internal Cache LM63                                | \$169  |
| 386DX-40* 128K Internal Cache LM58                              | \$199  |
| 486SX-25 256K Cache Upgradable CPU/Socket and 3 Local Bus Slots | \$299  |
| 486SX-33 256K Cache Upgradable CPU/Socket and 3 Local Bus Slots | \$349  |
| 486DX-40* 256K Cache L.B. CYRIX CPU                             | \$419  |
| 486DX2-50* 256K Cache L.B. CYRIX CPU                            | \$449  |
| 486DX2-66* 256K Cache L.B.                                      | \$495  |
| 486DX4-100 256K Cache L.B. PCI/ISA                              | \$1395 |
| NEW PENTIUM 60MHz/512 Cache VESA/ISA                            | \$1195 |
| NEW PENTIUM 66MHz PCI/VESA                                      | \$1595 |
| NEW PENTIUM 90MHz PCI/VESA                                      | \$1895 |
| NEW PENTIUM 100MHz PCI/VESA                                     | \$2695 |

\*AMD CPU. Without Asterisk- INTEL CPU

## FLOPPY DRIVES

1.44 Mb 3 1/2" F.D.D. \$69.00  
1.2 Mb 5 1/4" F.D.D. \$89.00

## CD ROM DRIVES

**WEARNES CD-120 DUAL SPEED CD ROM IDE DRIVE with instructions & software.** \$249  
**562B CD ROM DRIVE DOUBLE SPEED** with software drivers for all drives. \$249  
**563B CD ROM DRIVE DOUBLE SPEED** works with all Sound Blaster Cards. \$289

## DOS 6.2 SETUP

With upgradable motherboard  
WAS \$22 NOW \$15

## DISCOUNTED SOFTWARE

DOS 6.22.....\$89  
M.S. WORKS.....\$99  
DOS 6.22 & Windows 3.11.....\$149  
DOS 6.22 & Windows for WorkgroupS.....\$179  
MS MONEY.....\$44  
MS BOOKSHELF.....\$129

\*When purchased with a system only.

## 386SX 40

\$1030  
Tax Inc \$1245

## 386DX 40

\$1090  
Tax Inc \$1319

## 486SX 25

\$1239  
Tax Inc \$1499

## 486DX 40

\$1350  
Tax Inc \$1629

## 486DX2 50

\$1350  
Tax Inc \$1629

## 486DX2 66

\$1425  
Tax Inc \$1719

## 486DX 100

\$2150  
Tax Inc \$2599

## PENTIUM 60

\$1999  
Tax Inc \$2418

## PENTIUM 90

\$2550  
Tax Inc \$3085

## 4 YEAR PARTS & LABOUR WARRANTY

All systems include 212 MEG Hard Disk-4 MEG RAM-101 Keyboard-14" SUPER VGA (1024 X 768) (0.28" DOT PITCH) Colour Monitor - 2 SPK Ports-1.44 MEG 3 1/2" FDD-Mini or Baby AT casing-3 Slots VESA Local Bus Motherboard & VESA Local Bus 1MB VGA Cards are supplied in 486 machines AT NO EXTRA COST (Up to 1280 x 1024 Resolution)

**CASH SPECIALS**

# MAESTRO MODERN PRICING MADNESS!! PRICES SLASHED AGAIN!!

**DON'T MISS THIS OPPORTUNITY!**  
WAS NOW  
96M INTERNAL 9600BAUD.....\$449 \$359  
96M EXTERNAL 9600BAUD.....\$449 \$349  
96FM INTERNAL 9600BAUD.....\$499 \$359  
96FM EXTERNAL 9600BAUD.....\$499 \$369  
144M INTERNAL 14400BAUD.....\$499 \$379  
144M EXTERNAL 14400BAUD.....\$479 \$369  
144FM INTERNAL 14400BAUD.....\$549 \$399  
144FM EXTERNAL 14400BAUD.....\$499 \$389  
**FM MEANS FAXMODEM**

**MEMORY** 1-9 25+ 100+  
**SIMM**  
1M x 9-60 \$79 \$77 \$75  
1M x 9-70 \$65 \$63 \$59  
4M x 9-70 \$239 \$229 \$219  
**72 PIN SIMM FOR PENTIUM M.B**  
4M X 9-70 \$279 \$265 \$259

**HARD DRIVES VOICE COIL IDE HD**  
Cap Av. Access Tax Inc. Tax Ex.  
212M 16ms \$289 \$238  
260M 16ms \$299 \$247  
345M 12ms \$395 \$326  
420M 12ms \$399 \$329  
540M 12ms \$499 \$410  
#810M 12ms \$839 \$695  
#1.08GB12ms \$1069 \$885  
#These drives come with Disk Management Software to overcome DOS limitations. (Drives will normally go to 525MB/byte max).

**NEW MONITOR RANGE:**  
All these superb monitors on display at all Stores  
• 14" Super VGA 1024 x 768 (0.28mm Dot Pitch).....\$369  
• 14" Non-interlaced 1024 x 768 (0.28mm Dot pitch).....\$419  
• 15" XGA Analogue 1280 x 1024.....\$549  
• 15" XGA Digital 1280 x 1024.....\$699  
• 15" XGA Digital MPRII 1280 x 1024.....\$749  
• 17" XGA Digital MPRII.....\$1395  
15" & 17" Digital Monitors comes with Economy Management Software.

**SOUNDBLASTER CARDS**  
NEW Sound Blaster Pro VALUE EDITION with Lemmings & Indy 500.....\$160  
Sound Blaster Deluxe.....\$90  
Sound Blaster 16 bit.....\$189  
ASP Chip.....\$99  
Video Blaster SE.....\$495  
Video Blaster FS200.....\$649  
Game Blaster CD16 Pk 7 CD Titles.....\$799  
TV CODER.....\$290  
\*16 bit Discovery Pack CD16.....\$529  
\*8bit Discovery Pack CD8.....\$529  
(With Zork).....\$579

## EPSON STYLUS COLOUR INKJET

Affordable colour at 720 dpi!  
Features include:  
• 720dpi resolution with special paper. • 64 nozzle (black) and 3x16 (colour) nozzle ink jet dot matrix.  
• Parallel & Apple interface serial ports with auto-switching 240 cps LQ (12 cpi) • 100 sheet paper cassette • 30 columns • 9 standard fonts • ESC/P 2 with scalable font  
720DPI paper.....\$49.95  
360DPI paper.....\$45.95  
COME IN PACKET OF 200 SHEETS  
Printed colour samples available - just send us your business card!  
\$1199  
\$995  
Tax Ex.

## UPGRADE TO WEARNES OEM Pack

An easy do-it-yourself CD-ROM Drive & Sound System kit... Perfect addition to your new computer system configuration.  
Includes:  
Wearn's CD-110 CD-ROM Drive, 16 bit Sound Card & Microsoft Bookshelf CD to get you up and running.  
DOUBLE SPEED CD-ROM DRIVE  
NOW \$399

## ROD IRVING ELECTRONICS PTY. LTD

FOR THE SERIOUS COMPUTER USER Est. 1977 A.C.N. 005 428 437  
HEAD OFFICE: 56 Renver Rd Clayton, Victoria, 3168 Ph: (03) 543 7877  
MELBOURNE: 48 A Beckett St. City. Ph: (03) 663 6151  
OAKLEIGH: 240C Huntingdale Rd. Ph: (03) 562 8939  
NORTHCOLE: 423 High St. Ph: (03) 489 8866  
BOX HILL: 1031 Maroondah Hwy. Ph: (03) 899 6033  
ADELAIDE: 241-243 Wright St. Ph: (08) 211 7200  
SYDNEY: 74 Parramatta Rd, Stanmore. Ph: (02) 519 3888  
BLUESTAR COMPUTERS: 271 Maroondah Hwy. Ringwood Ph: (03) 870 1800  
Fax: (03) 879 3027 TRADING HOURS: Mon/Fri 9am - 5.30pm Sat 9am - 1pm  
City store open till 8pm on Fridays. Box Hill store open till 3pm on Saturdays.  
Tax Exempt sales: RITRONICS WHOLESALE Ph: (03) 543 2166 Fax: (03) 543 2648  
RIE BULLETIN BOARD Ph: (03) 562 7877 For Specials, info & Shareware  
MAIL ORDER: Ph: (03) 543 7877 Fax: (03) 543 8295  
Mail Order Hotline 1-800 33 5757 ARAOCT94

# DISCOUNTED PRICING!! EPSON PRINTER WAS \$349 NOW \$319

**NEW EPSON LX-300** Narrow carriage, colour upgradeable, near letter quality personal high speed dot matrix printer.  
WAS \$279  
PRICE CRASH  
\$249  
Colour upgrade option \$89  
Complete Package.....\$329

## EPSON STYLUS 800+

A 48-NOZZLE INKJET PRINTER  
Features include:  
• 360 DPI text & graphics.  
• 48-nozzle ink jet.  
• Quiet printing.  
• 198 cps LQ (12 cpi)  
• Compact, streamlined design. Small footprint.  
• Drop-in cartridge prints up to 700 pages at 1000 character/page.  
• Epson ESC/P 2™. Enhanced printer control language adds scalable fonts and improved graphics capability.  
WAS \$579  
PRICE CRASH  
\$559

## NEW PRODUCTS EPSON STYLUS 400

An entry level Inkjet Printer that output at 360dpi, with economically priced ink cartridge and a low price tag!  
Features include:  
• 48-nozzle ink jet.  
• 80 column  
• 100 paper sheet  
• Parallel port standard  
• Compact, streamlined design. Small footprint.  
• Economy mode to conserve ink  
• Epson ESC/P 2™. with scalable fonts  
• Driver disk included  
Print speed - 144 characters per second (12 cpi)  
WAS \$499  
\$415  
Tax Inc.

## VERBATIM DATALIFE 3.5" HD DISKS

| DESCRIPTION | 1-9     | 10+     |
|-------------|---------|---------|
| 3 1/2 DS/DD | \$18.95 | \$17.95 |
| 3 1/2 DS/HD | \$23.95 | \$22.95 |
| 5 1/4 DS/DD | \$13.95 | \$12.95 |
| 5 1/4 DS/HD | \$18.95 | \$17.95 |

## COMPUTER CASES

MINI TOWER CASE WITH POWER SUPPLY 200W.....\$79.00  
FLIP TOP CASE WITH POWER SUPPLY 200W.....\$79.00

## MOUSE SPECIAL!

out the door it goes...  
Was \$29.95 now only \$16.95  
200 only. Be quick!

## BULK DISK PRICES

All disks come with Write Protects and envelopes and a life time warranty.

| DESCRIPTION | 1-9 boxes | 10+    | 50+    | 100+   | 500+   |
|-------------|-----------|--------|--------|--------|--------|
| 5 1/4 DS/DD | \$4.50    | \$4.50 | \$4.50 | \$4.30 | \$3.95 |
| 5 1/4 DS/HD | \$7.95    | \$7.75 | \$7.50 | \$6.90 | \$6.90 |
| 3 1/2 DS/DD | \$7.50    | \$6.95 | \$6.75 | \$6.50 | \$6.00 |
| 3 1/2 DS/HD | \$7.75    | \$7.50 | \$6.95 | \$6.25 | \$6.00 |

## FREE CATALOGUE

ERRORS & OMISSIONS EXCEPTED. PRICES CHANGES WITHOUT NOTICE



There are approximately *four million* licensed radio amateurs around the world — some 500,000 of them in the United States and more than 1,500,000 in Japan alone.

In Australia, over 18,000 people are licensed as amateurs by the controlling government department, the **Spectrum Management Agency (SMA)**. The **Wireless Institute of Australia**, representing just over one third of Australia's amateur population as members, deals with the department on behalf of Australian amateurs.

You can write to the WIA at PO Box 300, South Caulfield, Victoria 3162.

People become amateur operators for a variety of reasons, but probably the most important one is that they want to *experiment* in the many facets of wireless communication.

Unlike CB radio, therefore, the issue of an amateur radio licence requires an examination of the applicant's knowledge of the basic principles of radio and electronics, international radio regulations and, in most cases, the ability to send and receive Morse Code.

While this may seem difficult, people from all backgrounds and age groups have passed these examinations, often with no more assistance than the books available from their local library.

Australia has scores of amateur radio clubs spread throughout the country, and many of these provide classes for intending amateurs.

Some classes are free of charge; others may carry a nominal cost.

Many clubs also conduct the examinations you need to pass to get on the air.

Lists of radio clubs and accredited examiners are published periodically in **Amateur Radio Action**.

In your reading of **Amateur Radio Action** you may encounter some strange and unfamiliar terms.

Radio amateurs use a form of 'shorthand' developed from the abbreviations developed decades ago for use with Morse Code.

Here are some of them: A **QSO** is a contact with another amateur station. A **QSL** is a card confirming such a contact.

The **QTH** is the location or address of an amateur station (often indicating where a QSL card may be sent). **QRP** means low power operation (usually less than five watts output). **DX** refers to long distance, so a 'DX

# TO ALL NEWCOMERS

station' is usually an overseas radio amateur.

His 'QSL route' is the address to which a QSL card can be sent. **MF** means 'Medium Frequency' and, to the radio amateur, indicates the long-wave 160 metre band.

**HF** means 'High Frequency' and the shortwave bands from 80 to 10 metres.

Our access to these bands means that most amateurs are able to contact virtually any point on the earth's

---

**Welcome to Amateur Radio Action, the only journal of amateur radio in Australia available on the news stands. If you are not a radio amateur, this page may assist you to better understand the hobby sometimes also known as 'ham radio'. It is not possible to tell you all there is to know about amateur radio on one page, but we can at least try to explain what our magazine is all about and where you can discover more about this fascinating hobby.**

---

surface, day or night.

**VHF** means 'Very High Frequency'. Amateurs in Oceania have access to two VHF bands, which are called the six and two metre bands.

**UHF** is 'Ultra High Frequency', and includes three amateur bands. Radio amateurs in Australia are permitted to use one MF band, eight HF bands, two VHF bands, three UHF bands and seven **SHF** — *Super High Frequency* — bands.

Amateurs communicate together in many different ways. **CW**, the oldest of our modes, means 'Continuous Wave' and most signals using this mode use the Morse Code.

**Phone** means any mode using normal voice operation. Phone modes include AM, or 'Amplitude Modulation' (as used by Medium Wave commercial radio stations); **FM** is 'Frequency Modulation' (as used by the 88 to 108 MHz FM radio stations);

and **SSB**, which is 'Single Sideband', a specialised voice mode which uses only half the band space of AM or FM.

**RTTY** is 'Radio Teletype', a means of sending and receiving 'hard copies' of messages by radio using a computer or teleprinter machine.

**AMTOR** is an advanced form of error-free RTTY.

**Packet Radio** is a sophisticated means of linking computers via radio.

**PacTOR** marries AMTOR and packet together for fast, error-free transmissions.

**ATV** is *Amateur Television*, where amateurs experimenting with 'fast-scan' color TV transmissions which can often be monitored on UHF TV channel 34.

**SSTV** is 'Slow Scan Television', a means of sending less sophisticated television pictures around the world on the HF bands.

Amateurs also send messages via facsimile — just like the fax in your office, only it's via the radio — and have launched more than 20 orbiting satellites which relay normally short-range VHF and UHF signals around the world.

**Amateur Radio Action** is a mix of news, feature articles and regular columns for radio amateurs and short-wave listeners (SWLs). **Page 5** is the Editor's page, usually devoted to matters of topical interest.

**NEWS DESK** contains news items, announcements, short articles and new product information. **DX & BAND REPORT** contains information of interest to HF operators. The **IPS PREDICTIONS** report provides graphical information which can be used to work out which DX locations might be heard on a particular band at different times of the day from the east and west coasts of Australia.

**SHORTWAVE** is a column for short-wave listeners, containing news about shortwave broadcasting stations.

**Amateur Radio Action** feature articles cover a wide range of radio-related topics including reviews of new products, equipment construction projects, modifications to equipment, amateur operation in other countries, stories from the early days of radio experimentation (which started with Marconi late last century), antenna construction projects, and discussion of matters affecting amateur radio operation. And, of course, there's much, much more...





## WORLD NEWSDESK

### NASA STIMULATES USE OF SCIENCE DATA OVER THE INTERNET

NASA is to form a Remote Sensing Public Access Center (RSPAC) for demonstrating, testing and transferring technology to help provide public use of Earth and space science data over the Internet.

The intent of the new center is to stimulate broad public use, via the Internet, of the very large remote sensing databases — maintained by NASA and other agencies — to stimulate U.S. economic growth, improve the quality of life and contribute to the implementation of a National Information Infrastructure.

"We are looking forward to working with BDM to assist the public in accessing and using NASA data," said Lee B. Holcomb, NASA's Director for High Performance Computing and Communications.

"We envision that this center will play a key role in developing universal access to the products of NASA's Earth and space science research."

BDM will receive \$12.8 million under a cooperative agreement to establish the RSPAC, which will demonstrate, test and facilitate remote sensing database applications and new digital library technologies. BDM will be supported by West Virginia University Research Corp., Morgantown, and Jardon and Howard Technologies in Winter Park, Fla.

The West Virginia University/NASA Independent Verification and Validation Facility in Fairmont, W.Va., will be the central site for RSPAC activities.

The center will extend access to remote sensing data beyond the usual scientific community.

By providing Internet access and user help, remote sensing data now will be available to the educational community (from K-12 to the university level), television and print media, libraries and hobbyists.

Because the data will be available over the Internet, non-traditional users will have much greater ease of access than in the past.

### EXAMINATIONS UNDER REVIEW

Readers may not be aware that the syllabuses for both AOCP, AOLCP and NAOCP examinations are currently under review.

A small group of volunteers has been working within the WIA for some time on the review and extension of the examination question banks and on the updating of the syllabuses.

Drafts of the revised AOCP, AOLCP syllabus have been circulated to each WIA Division and to a few other interested parties (including ARA's columnist Paul Butler) for comment.

It is expected that the NAOCP revision will be circulated similarly very shortly, and that further consultation with the SMA will follow. No changes to the present examination question bank or proceedings will be made until all the revisions are finalised and approved by the SMA. There will of course be a period of overlap to allow for candidates affected by the changes. A similar revision of the Regulations question bank will take place when the new regulations are finalised.

If any readers wish to comment on any of the syllabuses, they should contact Brenda Edmonds, VK3KT, through the WIA Federal Office at PO Box 2175, Caulfield Junction, Vic 3161.

### SAREX CELEBRATES APOLLO 11

In commemoration of the twenty-fifth anniversary of the Apollo 11 mission, the STS-65 SAREX station on board the Space Shuttle Columbia operated as a special event station from 17:13 UTC, July 19 until 13:43 UTC, July 21.

The SAREX station joined at least 12 other amateur stations associated with the National Aeronautics and Space Administration in commemorating the landing of the Apollo Moon Lander Eagle on the moon's surface

in 1969.

Contacts made during the event will be eligible for a special commemorative certificate. Please send your report and QSL with a large 9-inch by 12-inch self-addressed stamped-envelope to the ARRL Educational Activities Department, STS-65 Apollo Special Event, 225 Main Street, Newington, CT 06111.

### CHINESE HAM EXAMS

On the international scene, word that the first ever Individual Amateur Radio Operator's Licence exams were scheduled to be held July 16 and 17 in up to 26 cities.

Organized by the Chinese Radio Sports Association, the tests covered five different categories of hobby radio operations.

These include two types VHF only amateur radio, two types of high frequency licences and a special class for Chinese citizens who want to own a shortwave receiver to SWL.

Different requirements exist for the different classes of hobby radio operations. The contents of these exams are said to have included Chinese radio regulations, approved communication procedures and radio theory.

For high frequency operation the tests also included examinations on international phonetics and Morse code. No word on how many candidates were tested, and how they did.

### DXCC UP

The ARRL reports that business is up in its DXCC Branch. In March, 1127 applications for new awards and endorsements were received, and for the first three months of 1994 applications are up by 18%, QSLs by 48%, over 1993.

Turn around time for awards right now is about three and a half weeks.

### VK2 UPDATE

As regular readers will have noted, we haven't mentioned the VK2 idiocy of recent months which may lead you to think that everything was finally resolved.

Wrong...

Although little has been sighted on the packet boards, the ongoing saga (or at least one person's viewpoint) has now found its way to the worldwide Internet...after all, why keep your dirty washing to yourself - why not display it for the world to see...

So now you don't even have to be



an amateur to read what's going on - anyone (and there are millions) hooked up to Internet can read just what a bloody mess the VK2s are in. Candidly, we would have thought that everyone involved would be bored stupid by this time and what purpose there is in placing it into the Internet defies understanding.

#### STOLEN EQUIPMENT DATA BASE

A data base of STOLEN amateur equipment has been put up under the CLIVE server at the VK4CXX BBS.

Currently the method of advising of stolen equipment seems to be sending out several files to every BBS in Australia. Not only does this waste disk storage space on each and every BBS in Australia, but it is also very wasteful of radio bandwidth.

As anyone who has done any work in data bases knows only too well, it would also prove very difficult to ensure that all those data bases were up to date.

To overcome those problems, the STOLEN data base has NOW been put up under the VK4CXX CLIVE server. Everyone can access this one server and enquire about details of any equipment in the data base.

The present CLIVE server only offers a logical OR search function, but this can still be very powerful.

To use this service, one constructs a mail message with the appropriate request in it. CLIVE will carry out the search using the given keywords, and return all matching records back to the requester.

For example, suppose I am offered a YAESU FRG7 at a price that is a steal. It might be a steal, or it may be stolen.

So I create the following packet mail message and send it off to CLIVE.

```
1 SP
CLIVE@VK4CXX.BNE.QLD.AUS.OC
2 REQUEST
3 TOPIC STOLEN
4 SELECT 1
5 SCAN FRG7
6 BYE
7 /ex
```

Line 1. Send a Personal message to the CLIVE server at VK4CXX

Line 2. The word REQUEST in the subject line says that I want to do a request.

Line 3. Select the STOLEN Topic.

Line 4. There is only one file in the STOLEN topic list, so select it.

Line 5. Do a scan for every record containing the characters "FRG7" and send those ones only back to me.

Line 6. Be a good packeteer and exit cleanly out of CLIVE.

Line 7. And finish off our mail message.

Back will come a mail message containing every record in the data base that contained the word FRG7. Note that this will also include all records that contain the string FRG7700, as this also matches the search criteria. The returned records will contain the serial number of the equipment if known, the owner, and other details.

We could have done a scan for YAESU, but there may have been dozens of records containing the word YAESU. There will be a far fewer number of records containing the word FRG7. Similarly, a scan can be done for serial numbers. Select your search criteria carefully. For example a search for KENWOOD would return several hundred records.... (They seem to be as popular with crims as they are with amateurs....)

CLIVE only does a simple textual match, it does not use indexes. Also, it cannot do combinatorial logic, e.g. "YAESU" AND "FRG7". I am working on the development of a server that will have this capability however. The actual STOLEN file sent out from the WIA had to be extensively massaged manually to make it suitable for use in a data base such as this.

Hopefully the WIA may see fit to keep the information in a more suitable format in the first place as it will save much work. Many thanks to Lee VK4CXX who has made his CLIVE server available to run this stolen equipment list.

Also, lets hope we see more intelligent use of the packet network, and less of the shotgun approach.

Doug Rickard  
VK4ZDR@VK4ZDR.GOLD.QLD.AUS

....

# amateur radio action

## ACP SYME General Manager

Richard Walsh

## Editor

Len Shaw VK3ALS

## Group Publisher

Max Hyde

## National Sales Directors

Deborah Anthony,

Peter Zavec

Phone: (03) 601 4222 (office)

Facsimile: (03) 670 9096 or

(03) 602 1402

Postal: GPO Box 628E,  
Melbourne 3001

Office: 603-611 Little Lonsdale Street,  
Melbourne, Victoria

Printed and published by ACP Syme  
Magazines Pty Ltd

Circulation: Judy Kiernan (02) 282 8265

## Display Advertising

### National Manager & Vic/Tas/NSW sales

Philippe Duparc (03) 601 4209

Queensland  
Geoff Horne Agencies (07) 202 6444

South Australia  
Tony Giuliani (08) 373 1142

Western Australia  
Kevin O'Keeffe (09) 381 7766

" " Fax (09) 382 4850

## Printed at:

Hannanprint Victoria,  
504 Princes Highway,  
Noble Park, Victoria 3174 (03) 213 3111

### ACP Syme Magazines Pty Ltd.

A.C.N. 064 335 619, 603-611 Little Lonsdale Street,  
Melbourne 3000.  
Phone (03) 601 4222

\* The price set out or referred to herein is a recommended price only and there is no obligation to comply with the recommendation. All prices referred to in **Amateur Radio Action** are recommended retail prices unless otherwise stated.

The publisher's terms and conditions are set out in its current advertising rate cards, which are available on request. They include an exemption clause, a monetary limitation of liability clause, and an indemnity from the advertiser and any advertising agent. Advertisers and agents are advised to read the card before placing any advertisement or series of advertisements. **Amateur Radio Action** regrets that it is not possible to verify information other than that conveyed in the editorial content of the publication.

Opinions expressed in the editorial content of this magazine are wholly those of the respective authors and are not necessarily those of the publisher.

Material contained in **Amateur Radio Action** magazine is protected under the Commonwealth Copyright Act 1968.

No material may be reproduced in part or in whole without written consent from the copyright holders.



amateur  
**radio**  
action  
September 1994 Oceania's Amateur Magazine \$3.95

**IC-820H: Significantly higher performance in virtually every respect...**

**LATE EXTRA**

**WORLD NEWSDesk**

### INTERNET TO BE REGULATED

(UPI) WASHINGTON, DC. The White House confirmed today that the FCC will become the Federal agency to assume responsibility for regulating the so-called "Information Super Highway." "Today this consists of an autonomous network of computers known collectively as the Internet. Usually reliable sources revealed that the government is becoming increasingly apprehensive about the Internet's uncontrolled growth and the potential for damage to national security. A highly placed government source was quoted as saying "...now anyone with a thousand dollars can obtain the computer hardware and software necessary to communicate on the Internet. Irresponsible individuals can easily transmit messages worldwide. Clearly, there is a need for government regulation."

In response to these concerns the FCC is rumored to be preparing restrictive regulations to assure "responsible use" of the Internet. The FCC is reportedly cooperating with other national and international agencies to coordinate these regulations. Several former eastern bloc countries and Italy are reportedly coordinating their internal regulation planning with the FCC.

Although details are sketchy at this time, these new regulations are likely to take the form of some sort of licence examination for Internet users. Despite the fact that a costly new government bureaucracy will be established, it will likely save money in the long run, according to government sources. "A single USENET posting may cost hundreds if not

thousands of dollars, therefore, if licensing reduces such postings by only 10% the savings will more than recover these additional costs", said a highly placed government source.

Expert government watchers have been able to piece together a fairly comprehensive picture of the soon-to-be-proposed licence requirements. Based upon the past history of the FCC, the test will likely consist of three parts: theory, jurisprudence and practice.

The theory portion of the examination will include written examination of the principles of digital logic, elements of generic machine language programming, and comprehensive knowledge of TCP/IP and network interfacing hardware.

The jurisprudence portion will assess the candidate's basic knowledge of the regulations governing use of the Internet and will cover ethical as well as legal issues. Licensing will likely include an "Internet oath" requirement in which the candidate will swear to uphold certain basic standards of conduct. Users of the Internet will be required to broadcast their licence numbers at logon and intermittently after connection to the Internet. The practice portion of the examination is likely to be the most controversial. Reportedly, all candidates must pass a typing skills examination and achieve no less than 40 words per minute to obtain a (temporary) novice licence. This must be raised to 80 words per minute before a regular-status licence will be issued. Novices will be restricted to operating networked computers having speeds of less than 5 MHz or operation of SLIP or dial-up connections of no greater than 2400 baud. (It is rumored that the FCC will make 5 MHz replacement crystals available at a nominal charge to temporarily slow computers of novice operators).

The FCC also recognizes that there are conditions when terminal emulators are not available. Therefore, an expert class will be established for communication using only numeric keypads and bi-digit numeric displays. Although needing a minimum of equipment, this mode will require sending, receiving and manual translation of raw ASCII codes. Guidelines for minimum communication rates for this mode have yet to be established while the FCC awaits public input. Although felt to be a desirable

goal for all users, this class of licence will only be required by individuals operating wireless (RF) LANS.

Asked what the effect of proposed regulations would have on the Internet, a highly placed official noted that these rules "should not be considered prohibitive, as they simply bring regulation of the Internet in line with other communication modes under FCC governance." However, the source did feel that such regulations should be very helpful in restraining the rapid growth of the Internet.

*(more on page 23)*

### GOLD COAST PBBS VK4WIG NOW ON AIR

The Gold Coast Amateur Radio Society Inc (GCARSI) is pleased to announce that the official club Packet radio Bulletin Board System (PBBS) VK4WIG-1 is now operational on 144.725MHz providing a service to amateurs in the Gold Coast region of South East Queensland.

For the past few years, Nic Chantler VK4DIT has provided a very popular PBBS service for the Gold Coast with 60 to 70 users. However Nic's professional and academic activities during the next 12 months were going to make it difficult, if not impossible, for him to continue to run the PBBS from his home. The GCARSI has taken advantage of this opportunity and has installed a club station operating under the club callsign VK4WIG-1 on 144.725 MHz. Nic has supplied a computer, modems, and other hardware to the club to allow this club station to become a reality. About 25 years ago, the Gold Coast was the first club in Australia to install a VHF repeater for general use, and in doing so pointed the way for repeater use for many years. In installing one of the first club PBBS, the Gold Coast is again pointing the way, as it is expected that local club PBBS will be the way of the future with packet radio.

Gold Coast amateurs are encouraged to connect to VK4WIG-1 and register. Nic will continue to operate VK4DIT-1 for a short while so that users mail will not be lost, but the sooner users move to VK4WIG-1, the less problems that will be experienced when VK4DIT-1 finally ceases to provide a public service.

Nic (VK4DIT@VK4DIT) will remain Packet Officer for GCARSI, and Nic and Doug (VK4ZDR@VK4ZDR) will act



as Sysops for the new station. It is hoped to take advantage of having a club station to introduce other amateurs to the "fun" of being Sysop of a BBS. Many thanks to Nic (VK4DIT), GCARSI president Frank (VK4FN), Ausie (VK4TN), and others, who helped make this project a reality.

Please send inquiries to  
VK4WIG@VK4WIG.GOLD.QLD  
.AUS.OC

Doug Rickard VK4ZDR@VK4ZDR

#### ORACLE SAYS:

##### "NO CODE - WORLDWIDE"

Mandatory Morse Code testing for any class of ham radio licence, anywhere in the world, will be a thing of the past if the Organization Requesting Alternatives by Code Less Examinations has its way.

Up to now you probably have never heard of The Organization Requesting Alternatives by Code Less Examinations, but by the time the next World Radiocommunications Conference the group hopes to have the acronym of its name, ORACLE, and its goal of optional CW as household terms in the worlds ham radio community. Oracle is a newly organized international organization based in Wellington, New Zealand.

It holds the status of a legitimate New Zealand corporation. Its stated purpose is to do away with the mandatory knowledge of the International Morse Code as a requisite requirement for obtaining an Amateur Radio Licence anywhere in the world. A big undertaking yes, but one the six member board of directors feels it can accomplish.

ORACLE views as its fundamental mission to lobby for the modification of International Radio Article 32, section 2735. This rule says that any person seeking a licence to operate an Amateur Radio station below 30 MHz has to prove that he is able to send correctly by hand, and receive correctly by ear, texts of communications in Morse Code signaling.

ORACLE believes that the main reason that the Morse telegraphy requirement is being retained in ham radio is to limit access to amateur bands below 30 MHz.

It wants that policy changed.

Rather than attempting to work with national Amateur Radio societies — many of which are primarily in favor of retaining the code — ORACLE is bypassing them. Instead, the organi-

zation is taking it's case against keeping the code requirement directly to the international regulators and communications policy makers from every nation that belongs to the International Telecommunications Union. They say that these are the people who will make the decision as to whether the code stays or goes.

In other words, give every nation the option waiving code and code testing as a requisite requirement to operation on any valid Amateur Radio frequency — HF or VHF. It appears that ORACLE must have some pretty good funding behind it.

The group has already announced plans to present arguments for abolishing the current mandatory Amateur Service telegraphy proficiency requirement to the Voluntary Group of Experts subcommittee of the International Telecommunications Union. This, at or before the next two World Radiocommunications Conferences in 1995 and 1997.

For those of you who are interested, the address of the Organization Requesting Alternatives by Code Less Examinations — Code and Less being two separate words — is — 90 Campbell Street, Karon, Wellington, New Zealand.

Please mark your envelope to the attention of Mr. Bob Vernal, ZL2CA.

Their internet address — all in lower case letters is —  
vernal@corp.telecom.co.nz

#### CLASS LICENSING FOR CB AND HANDPHONE SERVICES

The SMA will introduce separate class licences for CB "other than repeaters" and 27 MHz Handphone services from 3 October 1994. This decision was made following public consultation during the inquiry into the apparatus licensing system earlier this year.

Class licensing received strong support in submissions to the inquiry.

Class licensing authorises the operation of equipment without the need for individual user licensing.

The good news for CB and Handphone users is that licence fees will no longer be payable after 3 October 1994.

According to the SMA, the introduction of class licences does not mean that CB and Handphone services will be deregulated.

Licence conditions, similar to those applicable under the current licensing

arrangements, will still apply and equipment will still need to comply with the existing technical requirements. Users of CB and Handphone equipment who are in breach of the licence conditions will still face penalties under the Radiocommunications Act.

For example, operating out of band or using a linear amplifier is still an offence under the class licence.

Further consultation will be undertaken over the next year on the possible introduction of class licensing for Amateur and 27 MHz Marine services. SMA offices in capital cities and regional centres have more information about the new CB and Handphone class licences.

*The above SMA release arrived just a couple of hours before press-time and too late to be expanded upon - which is also the reason for no "Editorial" column in this issue - it was based on precisely this SMA action but was "killed" when nothing was forthcoming from SMA earlier. There will certainly be more about it in the next issue...Editor*

## BATTERY BARGAINS

### Top Quality After Market Battery Packs to suit Icom Portables.

Packed only with Famous SANYO Heavy Duty, High Capacity Cells.

ABP-7 13.2V @ 600mAh \$119  
ABP-8 8.4V @ 1,000mAh \$99

OR

### Let Us Rebuild Your Old Pack

We use only high capacity, long life cells that usually increase original battery capacity by up to 30% . Brands include:-

ICOM-UNIDEN-KENWOOD-YAESU-ELECTROPHONE-REALISTIC-PHILIPS

|            |      |                      |
|------------|------|----------------------|
| IC-BP3     | \$55 | UNIDEN from \$35     |
| IC-BP2     | \$55 | Many Possibilities   |
| IC-BP5     | \$75 | Let us quote.        |
| IC-BP5A    | \$75 | Send your old pack   |
| IC-BP7     | \$95 | and we will install  |
| IC-BP8     | \$85 | new cells and        |
| CM-96      | \$95 | return it P&P FREE   |
| GME BP-475 | \$69 | Pay by Cheque C.O.D. |
|            |      | Credit Card - AMEX   |
|            |      | VISA-M/Car-B/Card    |
|            |      | Cheques to Rae Jones |

*Some batteries are not suitable for refurbishing*

## Rae Jones Direct

Strictly Mail Order Only

Send Orders to:-

P.O. Box 770, Mordialloc. Vic. 3195

or

Fax to (03) 801 0228 all hours



# KENWOOD TM-733A

*"a complex new dual-band FM  
transceiver"*

Review by Chris Edmondson, VK3CE

If you were to sit the new Kenwood TM-733A beside a five year-old dual-band amateur transceiver you'd certainly see a lot of changes. It would be smaller, of course, in all three dimensions, but you'd note at the same time how much bigger the display is. There's a big cooling fan at back whereas the older rig would have a heatsink. And there's a long row of buttons with absolutely no labels anywhere to be seen. It follows the recent Kenwood design criterion of being 'pretty' to look at... but no labels at all?

Relax. The TM-733A does so much that its buttons are multi-functional. Depending on which operating mode you're in at the time, the labels — which appear on the large LCD screen — change to reflect the current status.

The radio is small. In fact, I don't think it's much bigger than the current crop of monobanders — and they're only half the size you'd expect them to be!

But the versatility afforded by that tiny size is expanded mightily when you slide the tiny switch under the front panel and the remote-control pops off in your hand!

Your purchase of an optional cable assembly allows the bulk of the transceiver to be mounted under the seat or away in the boot.

Just the tiny front panel, which is smaller than many HTs, stays up front with you.

## The cook's tour...

Only a couple of the radio's front-panel buttons have printed labels. They're the VFO and MR keys on the left side and the PWR and PM keys opposite on the right. PM?

That's Programmable Memory to you, sport, and you may end up wondering how on earth you ever got by without it. We'll deal with that one soon.

Under the VFO/MR keys at the left is

a tiny little detented rotary encoder. I guess we would have called it a VFO knob a few years ago. I don't think I've ever seen a smaller VFO knob.

It's not even half an inch across in the old currency, but it somehow suits the radio quite well.

Although its purpose is completely obvious, it's not blessed with any markings at all, so you may spend a very long time — as I did — looking for the MHz shift key.

You would have thought that, *some-where* in a 116-page manual, they could possibly think to tell you to *push* the stupid VFO knob to change frequency in 1MHz steps, wouldn't you?!

On reflection, it probably *is* stated somewhere, but I just didn't find it. That manual! It's a real whopper, and shows the amazing complexity of this new radio.

That makes it easy to get very, very confused when trying to learn your way around this technological minefield.

I had no such problems changing between the bands. The two have separate volume and squelch controls, and I knew from previous experience that you push on the volume control for the band you want.

There is no separate band switch — and Kenwood's layout in this area is absolutely logical. Its tribanders work the same way, and it's simply not possible to get confused or make mistakes with this setup.

In common with a number of radios on the market these days, the TM-733A is set up for 1200 or 9600 baud packet when it leaves the factory.

There's a little pop-off cap thing right above the mic connector, which is on the right hand side of the front panel. (Actually, it's on the front of the radio itself.

If you remove the front panel, the mic connector and the data connector stay behind.) Under the cap you find a mini-



DIN connector. Excellent. No more unplugging the mic...

I suppose you'd like to know what those buttons actually do.

Each button has several different functions determined by the FUNCTION key, which is also unlabelled in the interests of beauty before clarity.

From left to right, the six buttons control CALL, LOW, SHIFT, TONE, REV and MUTE. Press the FUNC key first, then the signs on the LCD change to read C.IN, DIM, DTSS, T.ALT, STEP and A.B.C.

Press *and hold* the FUNC key and the six signs change again, to S.SQL, TOT, C.SEL, T.SEL and BEEP. It doesn't end there. The same six buttons are also used for the PM (programmable memory) channels, which are described next.

But don't ring yet!

You get even more. Each of these unidentified buttons has all of *five* or even more functions, including such important things as scanning, moving memory channels to the VFO and so on.

And while things like CALL, LOW and so on from those primary functions might make immediate sense, how many of the second and third layer controls do you recognise?

Many of these things are used so infrequently that they're a natural for the MENU mode Kenwood so thoughtfully provides on some of its other radios.

And wouldn't that fabulous alphanumeric display from Kenwood's great little





TH-79A be a godsend on *this* daunting radio!

The programmable memories are quite clever, if a little clumsy to the uninitiated.

The idea is that you set the whole radio up the way you want it then memorise the entire setup.

This includes VFO steps, time-out

timers, auto band change function... everything.

You could use this feature in a variety of ways — say, for a preferred RD contest setup and have another setup with CTCSS and funny DTMF-based DTSS systems for your chat channels.

Another set would step at the right spacings and offsets for repeaters, and

so on.

This idea is sound, and could be very useful for some.

Standard memory channels don't hold all the information used by a radio.

These PM ones do.

Personally, though, I think it adds yet

....



**EQUIPMENT EVALUATION.....**



# KENWOOD TM-733A

(continued from previous page...)

more confusion to an already confused layout. I'd rather see loads of normal memory channels instead of the rather basic 30 per band of this radio.

The back panel is very tidy. You get two audio connectors, one for each band (you can split the audio through two speakers or mix it in one), the cooling fan and two 'flying' leads.

The first of these is for power, and it

uses a cable shared with other major companies (Icom and Yaesu) in a very sensible move.

The second, of course, is the coax cable. The single cable for both bands is terminated in an SO239. A duplexer is built into the radio to mix the products. As an aside, the US version of this radio has two coax leads and no duplexer.

Curious...

A speaker is built into the top panel, recognising the fact that most mobile rigs are generally used in the shack. It sounds okay, too, though the receiver's audio bandwidth is somewhat limited at the top ranges, making it sometimes sound a bit woolly.

## On the air

When you have finally worked out how to get it to air (you wait until page 17 in the manual before learning how to turn it on, a process which is described in some rather greater detail on page 26!), the TM-733A actually sounds quite nice.

# ARA TECH SPECS

## KENWOOD TM-251 2M Mobile FM Transceiver

RRP: \$1,455

All tests carried out with regulated supply voltage of 13.8Vdc.  
All measurements made using supplied power lead.  
Signal generator 1kHz test tone - 3kHz deviation for FM.

### RECEIVER PERFORMANCE

*Sensitivity in microvolts  
for 12dB SINAD*

| Freq  | Level |
|-------|-------|
| 144.0 | 0.13  |
| 145.0 | 0.13  |
| 146.0 | 0.13  |
| 147.0 | 0.14  |
| 148.0 | 0.14  |

| Freq  | Level |
|-------|-------|
| 430.0 | 0.13  |
| " "   | " "   |
| " "   | " "   |
| 440.0 | 0.13  |

Receiver response from 430MHz to 440MHz showed only slight variation from the mean value of 0.13 microvolts for 12dB sinad.

*'S' Meter Response for  
input signal in microvolts*

| 'S'<br>Units | VHF  | UHF |
|--------------|------|-----|
| 1            | 0.4  | 0.2 |
| 3            | 0.75 | 0.5 |
| 5            | 1.35 | 1.0 |
| 7            | 2.8  | 2.0 |
| 9            | 4.8  | 4.5 |

*Squelch Response for antenna  
input signal in microvolts*

| Setting   | VHF | UHF  |
|-----------|-----|------|
| Threshold | 0.1 | <0.1 |
| Tight     | 0.6 | 0.35 |

Squelch hysteresis is adjustable from zero delay, 125ms, 250ms and 500ms which caters for a wide range of variables encountered particularly in mobile operation.

Audio output into 8 ohms - 2.10 watts RMS @ 10%THD

### Current Consumption

|         |                               |
|---------|-------------------------------|
| Standby | 0.59amps (590mA) mute closed. |
| Max AF  | 0.85amps (850mA)              |

### TRANSMITTER

Output Power measured at 146MHz and 435MHz using supplied power lead.

Note... At maximum power output terminal voltage measured at power socket had fallen from 13.8Vdc to 13.1Vdc.

### Output RF Power in Watts R.M.S.

| Level | VHF   | UHF   |
|-------|-------|-------|
| High  | 45.7  | 34.2  |
| Med.  | 12.48 | 13.04 |
| Low   | 5.58  | 5.34  |

### Deviation in kHz

| Source    | VHF  | UHF  |
|-----------|------|------|
| 1kHz tone | 4.9  | 4.3  |
| Speech    | 4.5  | 4.3  |
| CTCSS     | 0.82 | 0.84 |

### Current Consumption at 146MHz

|      |          |
|------|----------|
| High | 8.95amps |
| Med. | 4.8amps  |
| Low  | 3.2amps  |

### GENERAL

Memory channels 70 total

Frequency selection steps kHz:-

5, 10, 15, 20, 25 and 12.5



In common with too many radios from past days, this unit's audio is pretty thin unless you absolutely roar into that little hole on the multi-function microphone.

*(See photo of microphone).*

A businesslike tone of voice seems to do the trick, too, but this approach can tend to increase the sibilants to uncomfortable levels.

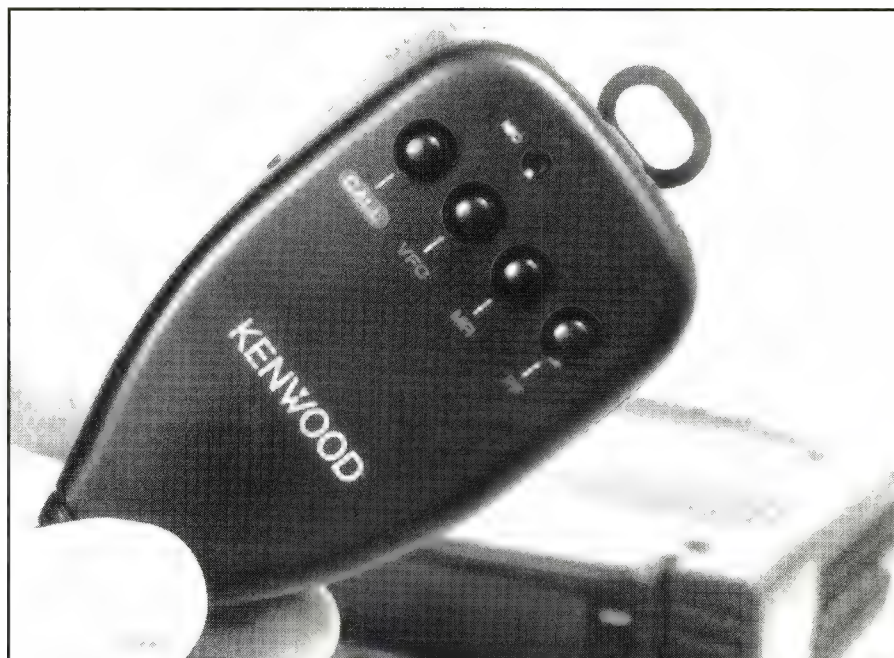
The cooling fan comes on the moment you hit the PTT. It runs for about a minute after you release the PTT then reckons the job is done. Don't sit anything solid on top of it in the shack, by the way.

The radio can get *really* hot if you cover the case... without the fan coming on. It appears not to be thermally-switched at all, merely on with PTT and off after time.

You get the basic 144 to 148 and 430 to 440 MHz, and that's that. It appears that Kenwood has made special efforts to extract top performance on the AM aircraft band, going as far as including special AM indicators on the clear but crammed LCD panel.

What a shame we can't tune there...

The plus side, though, is this radio's



reduced incidence of pager problems compared to some other radios which cover more territory.

As I've said before, I guess you have to weigh one against the other.

***As with the recent review of the TM-251, having said all the above, Kenwood has now advised us that the receive frequency range is modified at the factory to cover 118-174MHz.***

***As this modification had not been done when we reviewed this unit we are unable to say how it will react to pager interference.***

#### SUMMARY

I've recently heaped praise on a couple of Kenwood's other newcomers. The TH-79A HT is a real gem, as you'll read elsewhere in this issue, and the two metre TM-251A I reviewed recently is really very proficient indeed and beautifully easy to use.

Both of these radios are fitted with Kenwood's MENU mode, an electronic filing cabinet into which you fling a whole load of operator-modifiable parameters which you'd only need about once a year.

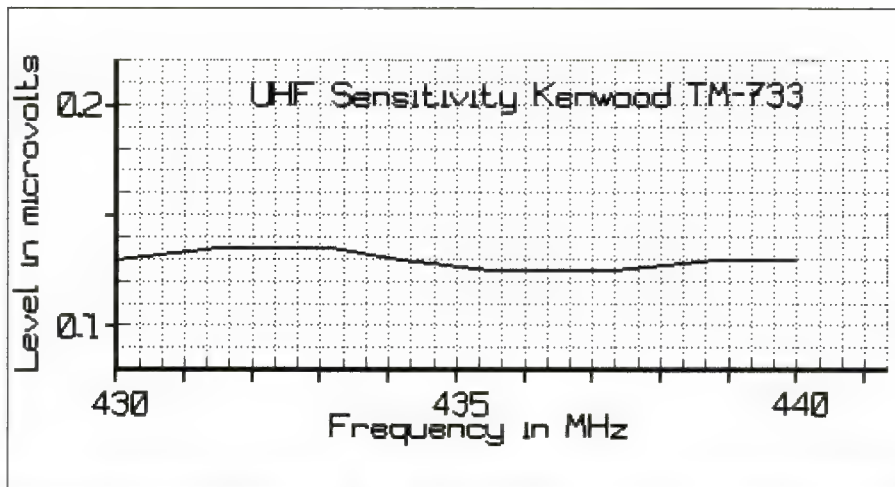
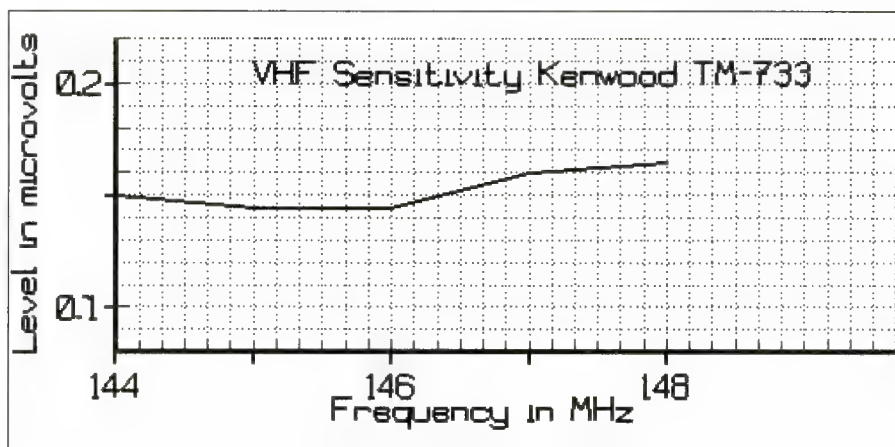
Icom's had the SET mode for years, and I'm very glad that Kenwood finally followed suit and introduced it as well.

Okay, so who forgot it in the TM-733A?

That long row of multi-function buttons on the front panel is there because this capable new dual-band transceiver does *not* have a MENU mode — and I'm sorry to say this is unfortunate.

Of all the radios to *not* install the

....



#### EQUIPMENT EVALUATION.....



# KENWOOD TM-733A

(continued from page 13...)

MENU, on this one it is absolutely unforgivable because the TM-733A has more features than any other dual-band radio I've ever seen. (If you don't believe me, look at the three different ways of using the squelch — manually (like normal), preset levels according to S-meter reading, or automatically determined in software!) I couldn't possibly tell you in one magazine article all the things this radio is capable of doing.

The list of what it *can't* do is shorter. It won't wash dishes, nor can it brush your teeth. It *will* do everything else.

But with almost all of the features at the same (top) level of operating and anything less than 100 buttons, the ergonomics are bound to be a nightmare. You are not going to find the TM-733A an easy radio to own as you will

spend a lot of time trying to fathom most of its features. It's not that it doesn't work well. Far from it, in fact.

The TM-733A works a treat. It sounds nice, hears very well, looks stunning — but needs a giant 116-page manual of instructions to drive it! Now come on.

This is an FM-only two-band radio. Why should it *need* 116 pages of instructions? That's just plain silly.

There is no question at all that the TM-733A does everything you could possibly ask of a dual-band. That's actually the problem. It does so much, and in so many different ways, that it will take you a very long time indeed to learn to drive a majority of its functions.

I doubt there is any one person on earth — including its designers — who can use all of its functions (without some

trial and error) before consulting the manual. I'm impressed with the level of functionality that Kenwood has built into this amazing transceiver.

If *only* all those clever functions had been put into some kind of background place like the MENU...

What it all boils down to is this: While I admire Kenwood's determination to make its radios beautiful to behold, I'd rather its designers concentrated on making them easier to use, irrespective of the finished product's appearance.

In sum, this is a great little (in size, not performance) mobile rig.

The one important thing that would have further improved my overall opinion is inclusion of the MENU function mentioned previously. I think a 116 page manual is something of an overkill, but, I guess more information than necessary is better than not enough.

*Amateur Radio Action thanks Kenwood Electronics Australia for the loan of the review transceiver.*

## CLUB INFORMATION REQUIRED

ARA receives many enquiries each month from both amateurs and would-be amateurs as to their nearest club and whether such club has regular meetings, when, where, how to join, does it conduct licence examinations, are there fees, etc. At this time, any such records that we do have comprise pretty much "address only" - and most of these are now probably out of date and/or incorrect. In an attempt to rectify this situation, we are asking that the responsible member of each club please supply us with as much info as possible (within reason of course) to enable us to start rebuilding a "club info database" and member/contact 'phone number for all enquiries. To make our job easier, please supply this information - ideally on disk, PC or MAC in ASCII format - otherwise on sheet of white paper using a GOOD typewriter ribbon (or word-processor print-out) and using the following format inc. CAPITALS where shown... The reason for the above request is that it will enable us to scan your club's info directly into a database without the need to retype it all.

Please use Capital letters and spacings as shown below...and make the city in which the club is located the First line of information.

### **CARLTON, VIC**

**CLUB:** West Woop Woop Radio Club.

**PO BOX ADDRESS:** PO Box 2345, Woop Woop 3456, Vic.

**CLUB ROOMS/MEETING ADDRESS:** Mechanics Beer Bar, 6789 Ale Way, Carlton 3333.

**WHEN:** Meetings are held second Tuesday of every month commencing 8.30pm.

### **GENERAL INFORMATION:**

The club has an active special interest SSTV group; runs an annual Field Day in August; has a Novice training course; sponsors the Woop Woop Award; has a membership of approx. 66; conducts examinations for all levels on a regular basis; sponsors VK#WWW repeater; welcomes visitors; provides members with a monthly club newsletter; operates a packet service on VK#WWW@V#SSS; conducts bi-monthly foxhunts, etc...etc..

**FURTHER INFORMATION FROM:** John F. Kentucky, 33 Washington Way, West Woop Woop - telephone (034) 123456, fax (034) 567890, packet VK#WWW@VK#DDD.

The above info will be placed on a database to enable us to provide the right answers to enquiries. It will also be run in either an issue(s) of ARA or the annual ARA Yearbook so your club's information will assist us to assist you.

**Send it to: Clubs, PO Box 622, Mount Eliza 3930, Victoria.**



# AMSAT... who?

By Chris Edmondson, VK3CE

**T**he various organisations around the world which go to make up the AMSAT operation are composed of quite an extraordinary group of like-minded people. But who are they, and what do they do? Before that, though, what are OSCARs... and who is RS?!

On the following pages you will read the 'Australianised' feature story (originally written for US operators), and may think that you won't be able to work the birds mentioned in that story.

And you'd be wrong! We checked the whole lot one evening while readying this story for publication — and heard several of them the first time out!

I've been having an absolute ball on AO-21 (RS-14) since reading the following article.

I can't crack it from the car (by heck I've tried!), but I sure can hear it.

And my own signals coming back from the satellite into my shack are almost noise-free — and that's running only 100 watts or so on 70cm into an omnidirectional gain antenna!

There are even regular monthly magazines specifically aimed at satellite experimenters, too, and not all of them are published overseas. Graham Ratcliff, VK5AGR, national coordinator of AMSAT-Australia, publishes a monthly newsletter which is available for \$25 from AMSAT Australia, GPO Box 2141, Adelaide, SA 5001.

Titles like this specialise in nothing but satellite working. But how did those amazing 'birds' get up there... who did all the work and who paid for it?

Amateur radio's satellite story began way back in 1961 when the first OSCAR went into space. An OSCAR, for those who don't yet know, is an **O**rbiting **S**atellite **C**arrying **A**mateur **R**adio. The first wasn't very sophisticated.

In fact, it was nothing at all like the devices up there these days. The first two OSCARs carried a transmitter but no receiver, and were widely heard around the world until their failures only scant days later. The third OSCAR, launched in 1965, lasted only three weeks, but it was the first to add a receiver to the parcel. More than 100 delighted amateurs in 16 countries made contacts through OSCAR-3.

Did you know there was a strong

Australian link in at least one of the early satellites? A number of pioneering Aussies, coordinated at Melbourne University, built the equipment which was sent into orbit as OSCAR Australis-5, but our involvement is low-key these days. Les Jenkins, VK3ZBJ, wrote a series of fascinating articles about the Australian involvement in OSCAR in this magazine about five years ago.

These days, amateurs from many countries are involved in our fraternity's own 'space race'.

Japan sent its first satellite up in 1986. Called JAS-1 at the time, it is now known as Fuji-OSCAR 12 (FO-12), but is no longer operational. That country's JAS-2 (Fuji-OSCAR 20), a low-Earth-orbit (LEO) craft which runs in Mode J, went up in 1990, and it still gives very good service from its 1500km orbit.

The Soviets (I guess they're Russians these days) have sent up a veritable armada of spacecraft, and the flotilla of Radio Sputniks (RS) are led by Russia's most impressive RS-10/11 transponder satellite. Most of the earlier Russian craft concentrated on HF communications, in keeping with the kind of equipment most readily available in that part of the world. In general, they still do...

The satellite gang really hit the big time in 1990, with the launch of a stacked hand of cubic baby satellites measuring only around 230mm each side (that's only nine inches!) and weighing about 10kg. The six chicks (too small to be called birds!), called Microsats, are the most advanced of all amateur satellites, and were constructed by a group of associations, being AMSAT-NA (AMSAT North America), AMSAT-LU (AMSAT Argentina) and BRAMSAT (AMSAT Brazil), as well as the USA's Weber State College (Webersat, of course), the ARRL and TAPR, better known for its exploits in the digital arena.

The Germans have been very active. AMSAT-DL is working on a new Phase III satellite which will have some six times the power of AO-13, and AMSAT-NA is in the building stages of a geostationary Phase IV bird, which will *really* be something to hear!

So we come back to the first question. What is AMSAT? AMSAT (literally standing for AMateur SATellite, although its real name is The Radio Amateur

Satellite Corporation) was founded early in the piece — in March, 1969 to be precise) when it became clear that direct amateur communication by satellite could be achieved if a coordinating body could lobby governments for free rides into space — not to forget meeting the not inconsiderable costs of designing, developing and building the equipment itself.

Do not underestimate the remarkable achievements of the AMSAT groups in the area of lobbying alone!

The commercial cost of boosting even a very small object into earth orbit is astronomical, if you'll pardon the pun.

Some of our satellites have been large and heavy, too, and the commercial value of the rocket launches alone must now be reckoned in the many millions of dollars.

If my counting is right, in all, 35 amateur satellites have been launched in the almost 33 years since the first launch in December, 1961.

What's more, fully 20 of them are currently active! But those to come will be better than all of them — far better.

You can bury yourself in information about getting involved with satellites. The article which appears here is just a tempter to get you interested.

The more I've looked at it the more interesting it seems. I'd recommend you start your reading with the chapter *Space Communications* in the ARRL Handbook, and go from there to the fascinating *The Satellite Experimenters Handbook*, which is also published by the ARRL.

Both of these titles cover the equipment, antennas, software, frequencies, modes... the lot, but the satellite book obviously goes into far greater depth.

The ARRL's latest *Antenna Book*, completely revised and published with a disk of computer software as recently as June of this year, also details many specific antenna designs for satellite chasers.

But don't be fooled into thinking you need a major multi-mode station with layers of beams or rows of dishes to work the satellites.

You can hear some of them on a two metre hand-held, and work through them with nothing more avant garde than a unidirectional whip!

The satellite arena is truly a fascinating place to explore. For more information, tune to 3.695 MHz Sundays for the weekly new bulletin or write to;

AMSAT Australia,  
GPO Box 2141,  
Adelaide 5001

Give 'em a whirl! You have nothing to lose



# A SATELLITE PRIMER

By Stephen Holmstead N7TQL

One thing that came through loud and clear in our recent reader survey was that there is a great deal of interest in satellites - but not all that much knowledge of them by non-satellite operators. The point was made fairly regularly that many amateurs would like to play around with satellites but lacked the "how to do it" information. The author is an American ham who started from scratch and his article really gets back to basics.

## MODES

The combination of uplink frequency, downlink frequency, and transmission mode are all lumped together into standardised satellite modes.

Here is a list of common satellite modes used by satellites covered by this article:

**A** — This mode requires a two metre SSB/CW transmitter and a 10 metre SSB/CW receiver and supports CW and voice.

**B** — This mode requires a 70cm SSB/CW transmitter and a two metre SSB/CW receiver and supports CW and voice. Some satellites also support RTTY and SSTV in this mode.

**K** — This mode requires a 15 metre SSB/CW transmitter and a 10 metre SSB/CW receiver and supports CW and voice. This mode is unique in that it can

be done with a simple HF rig.

**JA** — This mode stands for **J Analog** and requires a two metre SSB/CW transmitter and a 70 cm SSB/CW receiver and supports CW and voice.

**JD** — This mode stands for **J Digital** and requires a two metre FM transmitter and a 70 cm SSB/CW receiver and supports packet.

**S** — This mode requires a 70 cm SSB/CW transmitter and a 2.4 GHz SSB/CW receiver and supports CW and voice. Many people use a 2.4 GHz to two metre converter with a two metre SSB/CW receiver instead of buying a 2.4 GHz SSB/CW receiver.

**T** — This mode requires a 15 metre SSB/CW transmitter and a two metre SSB/CW receiver and supports CW and voice.

Some satellites have dual modes which operate simultaneously. For example, AO-13 can

operate in mode **BS** which means that it can do both mode B and mode S simultaneously. Other common dual modes are **KT** and **KA**.

Satellites have three basic types of retransmissions: beacon, transponder, and repeater. We would define these like this:

**Beacon:** Most satellites have a fixed Morse beacon

at the lower end of the satellite's band-pass transponder. This is useful to detect when the satellite has crossed the horizon and is in range for operation. It can also be used to determine Doppler shifts.

**Transponder:** A transponder is a band-pass repeater. It accepts a range of frequencies on the input and retransmits the entire range on the output. All offsets within that range are preserved.

Note that, since the satellite is transmitting many signals at the same time, it is dividing its output power amongst *all* of these signals. If someone transmits a very powerful signal into the satellite, it will spend most of its power retransmitting that signal and all of the other signals will drop in power. This is *not* the way to earn friends. People who overpower a satellite's input are called 'alligators' and are not very popular.

**Repeater:** This closely resembles a land-based repeater. It listens for signals on one frequency and retransmits them on another frequency. All satellite repeaters (and transponders) are full duplex, meaning you can (and should) listen to your signal on the downlink (with headphones) while you are transmitting.

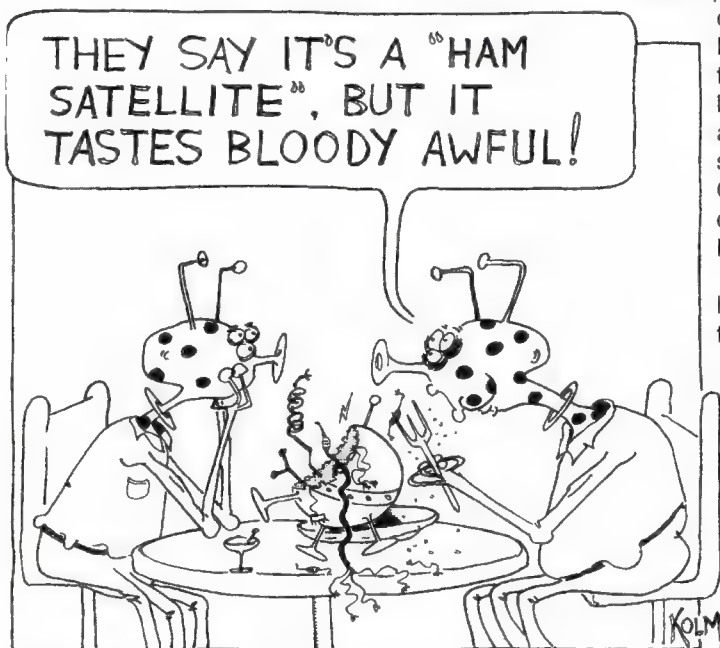
## SATELLITES

Some satellites are easier to work than others. The satellites which follow can be operated fairly easily and are referred to by some as the 'Easy Sats'. What follows is a brief description of each satellite. A summary list of operating frequencies is included later.

### MIR

Mir (pronounced 'mere', which means 'peace' in Russian) is the Russian Space Station. It's been in orbit since 1986. All recent Russian cosmonauts have been amateurs and have all had callsigns with MIR in them, such as U2MIR. Mir has two metre equipment on board and the cosmonauts operate packet and voice on 145.55 MHz. (This is the same frequency as the US Space Shuttles.) The cosmonauts also have a digital voice recorder which can repeatedly transmit voice announcements.

The best way to get a QSL card from Mir is to connect to its TNC mailbox, R0MIR-1, leave a message *and get a message number*. You *must* have the message number to qualify for a QSL. The TNC is often busy because amateurs forget to disconnect before Mir goes under their horizon. In a case like





this, try connecting to yourself or a friend via RØMIR. And if you hear a heavily-accented voice calling CQ, by all means say hello!

70 cm and ATV gear is being prepared for future flights!

#### **QSL Address:**

Sergei Samburov, RV3DR,  
Prospect Kosmonavtov. d.36, kw.96,  
Kaliningrad City,  
Moscow 141070,  
Russia.

Sergei can also be reached via packet radio as RV3DR @  
RK3KP.#MSK.RUS.EU

A special note on calculating Mir's orbit: Mir is big and it's in a low orbit. This means that there's a lot of atmospheric drag and it has to fire its rockets every month or two to boost itself back up or it would have re-entered and burned up long ago. Unfortunately, whenever this happens, it throws off all pass predictions. When this happens, Mir will arrive *later* than predicted, so if you tune to 145.55 MHz and nothing happens at the predicted time, keep waiting, and it may be along in 10-30 minutes.

*Seeing MIR:* Mir is also the only EZSAT that can be seen. Mir is very big, about the size of a semi-trailer, and when it comes over just after sunset or just before sunrise, you can often see it go by. This is because Mir will still be in sunlight while you're in the earth's shadow. In these cases, Mir looks like a very bright star gliding across the sky. It's a beautiful sight and well worth looking for.

It's best to use a tracking program set to *visual* to find visible passes. The best such programs will even draw you a star map and show you Mir's path across it. Don't forget to tune to 145.55 MHz when you see it. Also, don't forget to get on the local repeater and tell people when you spot it so that others can share in the fun.

#### **RS-10/11, RS-12/13, OSCAR 21(RS-14)**

These three satellites are all in 600-mile high polar orbits, which carry them over each country six to eight times a day for 10-18 minutes at a time.

They all have orbital periods of about 95 minutes and we typically get two sets of three or four passes spaced 95 minutes apart. The two sets of passes are spaced 12 hours apart and their passes come a little earlier each day because their orbits don't take quite exactly 95 minutes.

These satellites all have a coverage

circle about 4000 miles in diameter, so when they're about the horizon, you can use them to work anywhere within that range. If you draw a circle on a global map with its limit at 4000 miles, that's what you'll reach when the satellite is directly overhead.

If, however, the satellite is right on the horizon to you (meaning that you're at its extreme range — the outer limit of someone else's 4000 mile circle), you may be able to work over 8000 miles — clear to the other side of the world!

All of these satellites are in boxes which are bolted to larger Russian satellites and draw their power from the large satellite's solar cells. They are *very* easy to hear and fairly simple to work.

---

**"When I decided I wanted to get into satellites, I asked *many* people what it took to get started and what to do. I found few people who could offer all the information necessary to start. So, having finally found out everything I needed to know, I have attempted to compile all this information for future newbies. Also, if you really want to get serious about satellites, I would *strongly* recommend joining AMSAT to help promote the satellite hobby. AMSAT is a volunteer organisation which works for the interests of amateur satellites."**

---

#### **OSCAR 21**

My *favorite* satellite. This is a German/Russian joint effort radio which uses a Digital Signal Processor (DSP) chip... and it is Flexible with a Capital F!

OSCAR 21 was launched in January, 1990, configured as a linear translator which received a band of 70cm CW and SSB signals and relayed them on two metres. The bird was, to put it mildly, under-utilised. Then, in 1992, the DSP chip was reprogrammed in orbit into a

cross-band FM repeater! (If you've been wondering if DSP is as powerful as you've heard, now you *know*!) In the past year, its telemetry has been re-programmed from an obscure format to standard 1200 baud packet.

WEFAX pictures (which are uploaded by the ground controllers) were added in December 1993. (This is the same format used by many weather sats and shortwave weather stations.)

OSCAR 21 has an input frequency of 435.016 MHz, but 435.015 works just fine. Its output frequency is 145.987 MHz, but 145.985 or 145.990 will receive it quite well. It has a strong transmitter and a groundplane antenna and most HTs have no trouble picking out its signals when it passes over.

Mobiles and base stations with omnidirectional antennas will receive it full quieting. You can get into this bird with 20 watts and a six-element beam antenna. I mount my beam on a photo tripod next to my car and run coax to my dual band mobile. You have to point the beam accurately, though, so I take a list of altitude and azimuth bearing generated by simple tracking software out with me and re-aim the beam about once a minute.

Some OSCAR 21 tips:

- You can hardly get a word in edgewise during 'prime time' opening passes. Try the late night passes instead, as they're much less crowded.
- OSCAR 21's transmit and receive polarity rotate constantly during a pass. Mount your beam so you can easily rotate it for the best signal.
- Remember, all these amateur satellites are **full duplex**, so you can and should monitor your signal on the downlink. (But *do* use headphones!)
- Turn the beam for minimum noise.

OSCAR 21 is also known as **RS-14**, **AO-21** and **Rudak-2**. It's bolted to a satellite called **INFORMATOR-1**, which is often abbreviated **INFORMTR-1**. Its NORAD ID number is 21087. Be careful — the rocket booster which launched the satellite is still up there and it's named **INFORMTR-1 R/B** in some element sets. Your tracking program may find it instead of the satellite if you're not careful.

#### **RS-10/11**

This is probably the easiest satellite to work of them all. It has an *incredibly* sensitive receiver that can pick up the faintest two metre signal and relay it on

.... ➡



# A SATELLITE PRIMER

(continued from previous page...)

10 metres. There are documented examples of people having QSOs on RS-10/11 by clicking Morse on HTs with rubber duck antennas! I guarantee you that your HT can put a useable signal into RS-10/11. I've done it myself.

Warning: if you try this, disable the microphone (easiest way is simply to stick a bare 2.5mm plug into the ext mic socket) so you don't transmit any FM sidebands and make sure your CTCSS tone encoder is switched off.

RS-10/11 (Radio Sputnik) is for CW and SSB signals, so an *all-mode* two metre rig is ideal for transmitting to this bird. The input bandpass is from 145.860 to 145.900 and the output frequencies are from 29.360 to 29.400 MHz. There is also a Morse beacon at 29.357 MHz.

RS-10 is also equipped with a feature called **ROBOT**. The ROBOT is an automatic on-board QSO computer. To work it, send the following at about 15-20 wpm on 145.82 MHz (an automated keyer works best):

## **RS-10 DE (your call) AR**

If the ROBOT hears you, it will respond on its 29.403 MHz downlink with:

**(your call) DE RS-10 QSL NR (number) OP ROBOT TU USW QSO (number) 73 SK.**

If you want a QSL card, try sending the QSL number the ROBOT sent back to you on your QSL (along with an SASE and return postage) to:

Andrey Mironov  
UL Vvoloshinoy. D11. KV72.  
141000 Station Perlovskaya,  
Moscow,  
Russia

## **RS-12/13**

A cousin to RS-10/11, RS-12/13 is also a 40 kHz-wide linear transponder. However, this bird is unique because its input frequencies are in the 15 metre band!

This is also the only amateur satellite in the sky which Australian Novices have access to, because its input band is from 21.210 to 21.250 MHz.

Its output frequencies are from 29.410 to 29.450 MHz. Because of skip,

this satellite can often be heard and worked when it's below the horizon! At least one person has earned DXCC via this satellite!

RS-12/13 is bolted to yet another Russian satellite and its NORAD ID is 21089. RS-12/13 also has a ROBOT mode like its brother RS-10/11.

## **DOVE**

DOVE is short for **Digital Orbiting Voice Encoder** and is a transmit-only satellite (it has no user-accessible receiver). Built in Argentina, DOVE was launched in 1990 as a good will satellite to introduce children and newcomers to amateur satellites.

It was originally intended to transmit digitised voice messages that could be picked up by students with simple receivers. Unfortunately, the digital voice hardware and software has been a constant source of problems since launch.

Attempts to get DOVE to work properly are proceeding as this is written, so the best bet is to tune your two metre rig or scanner to 145.825 MHz and see what the bird is up to currently. Be ready for Morse, standard 1200 baud packet or (with luck) digitised voice messages.

The signals are strong enough so that an HT with a rubber duck will hear it when it's overhead, although ground plane antennas will give better coverage when the bird is near the horizon.

## **AO-10**

Known as **Phase 3-B** before its launch by the European Space Agency in June, 1983, this satellite was designed for launch into a high elliptical orbit.

This orbit, called a *Molniya* orbit, places the satellite over one spot on the Earth for up to several hours at a time. This orbital configuration also allows for consistent, long-haul DX communication because the satellite is visible to roughly half the Earth!

Its orbit virtually eliminates the frantic 'hurry up' style of operation. But such a luxury is not without cost.

At the farthest point in the *Molniya* orbit, this satellite is more than 25,000 miles away from the Earth, meaning high-gain antennas and higher power levels are required to get a workable signal up and through the bird.

Also, even though radio waves travel at the speed of light, the more than 50,000 mile round trip creates a signal path delay of about 0.25 seconds on the down-linked signal.

It takes some time for satellite operators to get used to simultaneously speaking and listening to their own voices returning in their headphones a quarter second later!

The first Phase 3-A launch ended in disaster when the Ariane booster malfunctioned, dropping the bird in the Atlantic.

Phase 3-B, later to become OSCAR 10, met with somewhat better fortune, surviving the launch and first burn of its 'kick motor' just fine.

However, we later learned that the booster had apparently bumped OSCAR 10 shortly after separation, which damaged one or more of its antennas and also caused other internal injuries because the second and subsequent kick motor firings never happened.

This left OSCAR 10 in a lower-inclination elliptical orbit.

This meant that the bird didn't have the intended operational coverage nor enough solar panel illumination to sustain full operations.

So today, OSCAR 10 is sort-of operational. It is stuck in mode B with only its omnidirectional antennas working, and it is slowly tumbling.

Users are requested to listen for AO-10's 145.810 MHz beacon for a steady, unmodulated carrier before operating the bird.

If the beacon is raspy or if your downlink signal appears to be shifting in frequency, users are asked NOT to use the transponder until it has a chance to slowly recharge its batteries.

## **AO-13**

Launched in June, 1988, OSCAR 13 is now carrying the bulk of the long-haul DX available via amateur satellite. It is the current — and much improved — brother to OSCAR 10. However, unlike OSCAR 10, it did managed to achieve its *Molniya* orbit.

OSCAR 13 also has the ability to automatically select transponders for each mode at different points in its orbit.

This helps optimise the mode in use with its corresponding downlink antenna gain. OSCAR 13 did have some problems, however.

It had a RUDAK experiment onboard which failed shortly after launch. Also, in June 1993, the 70 cm downlink transmit-



ter ceased to function, putting an end to Mode J and L operation.

However, modes B and S are still being supported and mode S is becoming increasingly popular.

Also, AO-13's batteries are beginning to show signs of age and its orbit is deteriorating.

The progressive effects of previously-unknown gravitational interactions between AO-13, the Sun, the Moon and the Earth will all conspire to cause the satellite's re-entry into the atmosphere sometime in 1996.

### ANTENNAS

For satellites like AO-13, the consensus is that *bigger* is the way to go. You can get commercially-made satellite antennas from people like Cushcraft, KLM and Telex/Hy-Gain or, of course, you can roll-your own.

But bigger is definitely better if you have the space. Several people have mentioned the KLM-22C and 40CX pair as excellent performers (again — you need the room for those long booms!).

One operator stated his pair of KLMs (the big ones!) lets him work AO-13 with 3 to 30 watts (hardline feed and rigorous attention to routing the feedlines and cables properly to maintain the antenna patterns helps, too).

Others mentioned the KLM 14C/18C pair as good performers — but you need more power on the uplink. Telex/Hy-

Gain antennas were recommended by several people as a less expensive alternative to KLMs which work almost as well.

There's also M<sup>2</sup> (started by an engineer from KLM). While no one who responded to my questioning actually used them, the information I received from a call to the factory in California suggests they are comparable to or slightly better than the KLMs in performance, and about the same in cost.

Home-brewing antennas is also feasible — it takes work, but attention to detail results in top-notch performance for very little money.

Problems encountered with AO-13 antennas include routing cables and feedlines off the back of the antennas (to preserve antenna patterns), use of fibreglass cross-booms, mounting preamps as close to the feedpoint as possible, and long antenna booms drooping.

It is recommended that you use a rope to brace the boom or stiffening booms and fibreglass masts internally with foam-in-a-can insulation.

Antennas for the low-altitude satellites appear to be much less critical. J-poles were most frequently mentioned (the design from the AMSAT Journal?), but dipoles, ground-planes, and Yagis are also in use.

Several people work RS-10 quite well with antennas in the attic.

Best results are with steerable antennas, but the high operator workload during a pass (unless the satellite is just grazing your access circle) almost demands computer control of the rotators.

### PREAMPLIFIERS

You need a preamp for AO-13. (I can hear the downlink after a fashion on a Ringo fed with cheap coax and a 10 dB preamp in the shack, but it's not communications-quality reception!) Only two people mentioned a specific brand name (Advanced Receiver Research and the unit included with the Ten-Tec 2510), so I assume almost any GaAsFET preamp in the 20dB gain class is adequate.

**The preamp must** (almost always) **be mounted at the antenna.** (Check the discussion in Chapter 9 of the Satellite Experimenter's Handbook and you'll see why!).

It is recommended that you mount the preamp at the antenna feedpoint, if your elevation rotator can handle the unbalanced load. While no one mentioned it (maybe it's obvious), if the antenna is used to transmit (say Mode J) as well as receive (on Mode B, for example), the preamp *must* either include RF-sensed switching, or be switched out of the line before you transmit.

*Transmitting into an unprotected preamp will destroy it instantly!*

Preamps also seem to help on RS-10 (especially with older HF rigs) and on the Pacsats. It seems to be a case of try it, and get a preamp if it looks like it would help.

### TRANSCEIVERS

Of the new equipment, four radios sold in Australia are specifically set up for satellite operation. They are the Icom IC-820H reviewed recently in ARA, and its more expensive brother, the IC-970H, the Kenwood TS-790A and the Yaesu FT-736R. The first one listed is brand new, the second Icom is about three years old, the Kenwood is about five years old and the Yaesu a bit older again.

Somewhat better in some respects, but far more expensive than buying any of the above, is to get the Icom IC-275H and IC-475H twins and add the satellite tracking module, which locks the two rigs together as one.

I'm sure other multi-mode radios, and setups with converters and transverters

....





# A SATELLITE PRIMER

(continued from previous page...)

work well, too. Power output required is a function of the satellite, your antennas, and how desperate you are to communicate.

QRP on the satellites is just like QRP on HF — you need good antennas and feedline, you have to pick optimal passes, and skilled operators at both ends are needed. Given the apparent 'calmer' operating style on AO-13, QRP is probably easier there than on 20 metres!

Anyway — about power for AO-13: 3-30 watts will work if you have top-notch antennas... but an amp will not go astray. For an 'optimum' station, it is recommended 60 watts on 70 cm and 80 watts on 2 metres for AO-13, assuming good antennas (Telex/Hy-Gain or better) and feedlines, or 20 watts to a 5ft dish for Mode L are the way to go.

You can, however, get by and have lots of fun with much less!

For Mode A, six watts to the AO-13 two metre antenna will work well.

People using omnis report success with the Pacsats running 50-70 watts to a J-Pole. Several people said they (or someone they know) have no trouble using RS-10 at lower power (10-25 watts) with simple, omnidirectional antennas. Again, it's a case of try it and see if it works. There was unanimous consensus that the receiving equipment (antenna, pre-amp, feedline, and receiver) is more important than the transmit equipment.

Running more power 'to hear yourself' is frowned upon, to say the least! It's also important to be able to vary uplink power to adjust to specific conditions.

our rigs!).

## ACCESSORIES AND OTHER STUFF

You need a PSK modem to use the Pacsats.

**PacComm** makes fully assembled units, either already integrated with its own TNC, or as a board you install in your TNC-2 clone. It makes similar 9600 bps units for accessing UO-22.

The downlink receiver (on 70 cm) should be capable of being tuned by the PSK modem's AFC lines.

Newer radios can use the up/down lines from the microphone jack or an accessory connection on the rear panel.

Older radios must be modified, or be tuned manually.

Just about any radio suitable for packet on two metres will work for AO-16, WO18, and LU-19.

To run 9600 bps on UO-22, modifications to bypass the microphone and speaker's audio processing circuits are required. I've seen some reports on packet and in the various Hamsat columns, that differences between UO-14 and UO-22's transmitters make UO-22 more difficult to copy. (I'll worry about that problem later — I'll start with AO-16 and LU-19 first!) We haven't yet mentioned computers — again, it must be obvious that you need one *in the shack* when working the Pacsats, or for automated, real-time control of antenna rotators (useful for low-altitude satellites).

Other operator aids: If your radio can't slave uplink and downlink tuning (all of the radio mentioned in the above section can), you need something to help convert between uplink and downlink frequencies (and account for Doppler shift and calibration errors on the radios' frequency readouts).

A cardboard slide scale or dial will work. I'm thinking of programming my HP48 to do the conversion for me. You need something like this to know where to tune on the uplink to hear a given downlink frequency.

## SOFTWARE TO TRACK SATELLITES AND PREDICT PASSES

There are many programs which work. Price ranges from free to quite a bit for state-of-the-art QuickTrack or InstantTrack (available from AMSAT). Special software is also needed to use the Pacsats, and to interpret telemetry data. This software is also available from the usual sources, and from AMSAT through its South Australian address.

Polarity switchers optimise antenna performance by allowing switching antenna feeds from RHCP to LHCP as the need arises.

They are a very useful add-on, but don't appear essential.

Equipment to measure power output, SWR, transmit frequency and the like, will all be useful.

## ALIASES: (THANKS TO N9LTD)

| <u>NORAD</u> | <u>Common Name</u> | <u>Aliases</u> | <u>(Parent satellite)</u>                                   |
|--------------|--------------------|----------------|---|
| 14129        | AO-10              |                | [OSCAR 10, Phase 3B]  |
| 14781        | UO-11              |                | [OSCAR 11, UOSAT-B, UOSAT 2]                                |
| 16609        | Mir                |                |   |
| 18129        | RS-10/11           |                | [RS-10] (COSMOS 1861)                                       |
| 19216        | AO-13              |                | [OSCAR 13, Phase 3C]  |
| 20437        | UO-14              |                | [OSCAR 14, UOSAT-OSCAR 14]                                  |
| 20438        | UO-15              |                | [OSCAR 15, UOSAT-OSCAR 15]                                  |
| 20437        | UO-14              |                | [OSCAR 14, UOSAT-OSCAR 14]                                  |
| 20438        | UO-15              |                | [OSCAR 15, UOSAT-OSCAR 15]                                  |
| 20439        | AO-16              |                | [OSCAR 16, Pacsat, Microsat-A]                              |
| 20440        | DO-17              |                | [OSCAR 17, DOVE, Microsat-B]                                |
| 20441        | WO-18              |                | [OSCAR 18, WEBERSAT, Microsat-C]                            |
| 20442        | LO-19              |                | [OSCAR 19, LUSAT, Microsat-D]                               |
| 20480        | FO-20              |                | [Fuji-OSCAR 20] (JAS 1-B)                                   |
| 21087        | AO-21              |                | [OSCAR 21, RS-14, RUDAK-II]<br>(INFORMTR-1 or INFORMATOR-1) |
| 21089        | RS-12/13           |                | [RS-12] (COSMOS 2123)                                       |
| 21575        | UO-22              |                | [OSCAR 22, UoSat 5, UOSAT-F]                                |
| 22077        | KO-23              |                | [OSCAR 23, KITSAT A, Uribyol 1]                             |
| 22654        | ARSENE             |                |   |
| 22825        | AO-27              |                | [OSCAR 27, AMRAD] (EYESAT-1)                                |
| 22826        | AO-26              |                | [ITAMSAT, IO-26, OSCAR 26]                                  |
| 22829        | PO-28              |                | [POSAT, POSAT 1, OSCAR 28]                                  |
| 22830        | KO-25              |                | [KITSAT B, OSCAR 25, Uribyol 2]                             |



# **FREQUENCIES**

Amateur Radio Satellite Frequencies (as of January 1994);

| <u>Designation</u> | <u>Freqs</u>  | <u>Transponder Mode</u> | <u>Beacon</u>                      |
|--------------------|---------------|-------------------------|------------------------------------|
| <b>AO-10</b>       |               |                         |                                    |
| Downlinks          | 145.810       | B                       | B                                  |
|                    | 145.825-.975  | T                       | B                                  |
|                    | 145.987       | B                       | B (Usually off)                    |
| Uplinks            | 435.027-.179  | T                       | B                                  |
| <b>RS-10</b>       |               |                         |                                    |
| Downlinks          | 29.357        | B                       | A                                  |
|                    | 29.360-.400   | T                       | A                                  |
|                    | 29.403        | B (Robot)               | A                                  |
|                    | 145.857       | B                       | T/KT                               |
|                    | 145.903       | B (Robot)               | T/KT                               |
| Uplinks            | 145.860-.900  | T                       | T/KT                               |
|                    | 145.903       | B (Robot)               | T/KT                               |
| Uplinks            | 145.860-.900  | T                       | T/KT                               |
|                    | 145.820       | B (Robot)               | T/KT                               |
| <b>RS-12</b>       |               |                         |                                    |
| Downlinks          | 29.408        | B                       | K                                  |
|                    | 29.410-.450   | T                       | K                                  |
|                    | 29.454        | B (Robot)               | K                                  |
|                    | 145.913       | B                       | T/KT                               |
|                    | 145.959       | B (Robot)               | T/KT                               |
| Uplinks            | 21.210-.250   | T                       | K                                  |
| <b>AO-13</b>       |               |                         |                                    |
| Downlinks          | 145.812       | B                       | B                                  |
|                    | 145.825-.975  | T                       | B                                  |
|                    | 145.985       | B                       | B (Usually off)                    |
|                    | 435.651       | B                       | L/JL                               |
|                    | 435.677       | RUDAK                   |                                    |
|                    | 435.715-6.005 | T                       | L/JL                               |
|                    | 435.677       | RUDAK                   |                                    |
|                    | 435.715-6.005 | T                       | L/JL                               |
|                    | 2400.664      | B                       | S                                  |
|                    | 2400.711-.749 | T                       | S                                  |
| Uplinks            | 435.423-.573  | T                       | B/S                                |
|                    | 435.601-.637  | T                       | B/S                                |
| <b>AO-16</b>       |               |                         |                                    |
| Downlinks          | 437.02625     | T/B                     | J Dig. (1200b SSB) (secondary)     |
|                    | 437.05130     | T/B                     | J Dig. (1200b Rai. Cos SSB) (pri)  |
|                    | 2401.14280    | B                       | 1200 bps SSB (Usually off)         |
| Uplinks            | 145.900       | T                       | 1200 bps AFSK FM Digital           |
|                    | 145.920       | T                       | 1200 bps AFSK FM Digital           |
|                    | 145.940       | T                       | 1200 bps AFSK FM Digital           |
|                    | 145.960       | T                       | 1200 bps AFSK FM Digital           |
| <b>DO-17</b>       |               |                         |                                    |
| Downlinks          | 145.82438     | B                       | 1200 bps AFSK FM or Dig Voice      |
|                    | 145.82516     | B                       | 1200 bps AFSK FM or Dig Voice      |
| Downlinks          | 145.82438     | B                       | 1200 bps AFSK FM or Dig Voice      |
|                    | 145.82516     | B                       | 1200 bps AFSK FM or Dig Voice      |
|                    | 2401.22050    | B                       | 1200 bps BPSK (SSB) (usually off)  |
| Uplinks            | None          |                         |                                    |
| <b>WO-18</b>       |               |                         |                                    |
| Downlink           | 437.10200     | B                       | 1200 bps BPSK, J Dig (Tele, Image) |

Uplink None

## **LO-19**

|           |         |     |                          |
|-----------|---------|-----|--------------------------|
| Downlinks | 437.125 | T/B | J Digital (secondary)    |
|           | 437.127 | B   | CW                       |
|           | 437.154 | T/B | J Digital (primary)      |
| Uplinks   | 145.840 | T   | 1200 bps AFSK FM Digital |
|           | 145.860 | T   | 1200 bps AFSK FM Digital |
|           | 145.880 | T   | 1200 bps AFSK FM Digital |
|           | 145.900 | T   | 1200 bps AFSK FM Digital |

## **FO-20**

|           |              |     |  |
|-----------|--------------|-----|--|
| Downlinks | 435.795      | B   | J Analog   |
|           | 435.800-.900 | T   | J Analog (See below)   |
|           | 435.910      | T/B | 1200 bps BPSK (SSB), J Digital   |
| Uplinks   | 145.850      | T   | 1200 bps AFSK FM Digital   |
|           | 145.870      | T   | 1200 bps AFSK FM Digital   |
|           | 145.890      | T   | 1200 bps AFSK FM Digital   |
|           | 145.910      | T   | 1200 bps AFSK FM Digital   |
| OR        | 145.900-6.00 | T   | CW/SSB (Alternates with above every other week. Changes on Wednesdays) |

## **AO-21**

|           |              |          |  |
|-----------|--------------|----------|--|
| Downlinks | 145.852-.932 | T        | CW/SSB   |
|           | 145.866-.946 | T        | CW/SSB   |
|           | 145.985      | Repeater | FM (Alternates with voice bulletins and telemetry) |
| Uplinks   | 435.022-.102 | T        | CW/SSB bulletins and telemetry)                    |
| Uplinks   | 435.022-.102 | T        | CW/SSB   |
|           | 435.601-.637 | T        | CW/SSB   |
|           | 435.015      | Repeater | FM (See above)                                     |

## **UO-22**

|          |         |   |                     |
|----------|---------|---|---------------------|
| Downlink | 435.120 | T | 9600 bps FM Digital |
| Uplinks  | 145.900 | T | 9600 bps FM Digital |
|          | 145.975 | T | 9600 bps FM Digital |

## **KO-23 (KITSAT)**

|          |         |   |                     |
|----------|---------|---|---------------------|
| Downlink | 435.175 | T | 9600 bps FM Digital |
| Uplinks  | 145.850 | T | 9600 bps FM Digital |
|          | 145.900 | T | 9600 bps FM Digital |

## **Mir**

Downlink 145.550 T/Robot (Packet mailbox. Alternates with simplex FM voice QSOs occasionally)

## **KO-25 (KITSAT-B)**

|          |                     |                         |
|----------|---------------------|-------------------------|
| Downlink | 435.175/436.500 MHz | 9600 bps FSK FM Digital |
| Uplink   | 145.870/145.980 MHz | 9600 bps FSK FM Digital |

## **AO-26 (ITAMSAT)**

|          |             |                      |
|----------|-------------|----------------------|
| Downlink | 435.867 MHz | 1200 bps PSK Digital |
| Uplinks  | 145.875 MHz | 1200 bps FM Digital  |
|          | 145.900 MHz | 1200 bps FM Digital  |
|          | 145.925 MHz | 1200 bps FM Digital  |
|          | 145.950 MHz | 1200 bps FM Digital  |

## **AO-27 (AMRAD)**

|          |             |                                 |
|----------|-------------|---------------------------------|
| Downlink | 436.798 MHz | Analog FM voice/9600 bps FSK FM |
| Uplink   | 145.850 MHz | Analog FM voice/9600 bps FSK FM |

## **PO-28**

|          |             |                             |
|----------|-------------|-----------------------------|
| Uplink   | 145.975 MHz | JD 9600 bps FSK (Primary)   |
|          | 145.925 MHz | JD 9600 bps FSK (Secondary) |
| Downlink | 435.075 MHz | JD 9600 bps FSK (Primary)   |
|          | 435.050 MHz | JD 9600 bps FSK (Secondary) |



**Invest  
in the  
future of  
amateur  
radio.**

**Join the**

**WIA**

**The National Society for  
Australian Radio Amateurs**

**For more information, forward  
this coupon, or write to:**

**WIA FEDERAL OFFICE  
PO BOX 300  
CAULFIELD SOUTH  
VIC 3162.**

Registered Address:

3/105 Hawthorn Road, Caulfield North, 3162.

Please send a WIA information package to:

NAME:.....

ADDRESS:.....

.....POSTCODE:.....

# Feedback...

There will be more letters on "Newcomers" in the next issue and we will publish the best of them - we simply ran out of time for this one...Editor

## NO MORE DX

*With the demise of sunspot cycle 22, and with it any DX worth knowing about, surely now is the time for ARA to drop Jim Smith's DX column and your own DX UPDATE in favour of material that has some bearing on present conditions. What's the point in having pages of useless DX information when basically there isn't anything to be heard?*

*Surely those wasted pages could be put to better use with information on the many other aspects of amateur radio which do not rely on sunspot propagation. Think about it.*

*John Robertson, VK3TAW*

**Pardon - am I missing something(?) - or does the last line of your letter actually refer to yourself? I am not wishing to be rude, but, if as you state there is no DX at this time, where the hell do you think all the DX information comes from...**

**I hope you don't think that Jim Smith and myself sit down at the typewriter and dream up DX which, according to you, does not exist. There is no argument that DX is no longer what it has been during the past few years, nor will be for several years to come, but, there's certainly plenty still about if you want to chase it.**

**Maybe the word "plenty" should read "some", but given the right equipment, time of day, a degree of patience, and a little bit of luck, you will find sufficient DX about to keep your QSL card stock reducing. If what you're saying is that you can't hear any DX because you have a piece of string hanging out the window and you only work 10m anyway then yes, I agree with you. If, however, you have a decent directional antenna (ideally a good mono for your favourite band) and a halfway reasonable transceiver you will most certainly still be able to work DX. Purely for interest I just turned on my rig and heard a number of European stations coming in longpath at between S2-S6 (1700Z) on 20m with numerous east coast VKs working them...and this is not unusual, not every day or at the same time maybe - but it's there. Mind you, to hear them that well I'm running a five element mono, but, I can still hear/work 'em (nowhere near as easily) on the R7 Cushcraft vertical...and I've worked a few on 40m using a piece of wire.**

**Still, you will have noted that we have introduced a few "non DX" articles to get you thinking about other things...this month it's satellites, but, we're certainly not reducing the DX pages.**

**Editor**

## NEWCOMERS ...?

*Present curriculum for Full Call has become obsolete. It is becoming more obvious that present requirement for knowledge of electronics as set by bureaucracy at its worst, and abetted by ever diminishing clique of die-hard professional electronic enthusiasts, for sole aim of preserving the exclusive club membership of the "Radio Amateurs" is slowly killing any prospect of long term survival of the hobby.*

*In early days after W.W.II as a young YU1BK operator I recognized that knowledge of electronics and Morse code was essential for pursuing of the hobby. There were no loms, Yaesus or Kenwoods to be found - I had to make my own transmitter. How sweet it was, I was young and with the help of the radio the world was opening before my eyes. I will always remember my first ever QSO (with a VK2 station "just back from the beach", while I was snow bound and freezing) However, we must wake up to the fact that our sacred hobby has been overtaken by a giant leap in technology of radio and telecommunication, which may I add, has not been exactly helped along by our "experiment and research" licenses.*

*I find that the requirement of detailed knowledge of electronic/radio theory (as necessary for obtaining an operating license) is no longer relevant in the age of ready made/plug it in equipment. We are under threat of losing our warranties for simply lifting the top cover of newly purchased equipment. So where do I stand now. After passing all these exams, and after more than 40 years of operation, I find that all my gained knowledge has gone rusty (ask how many fullcalls are actually capable of transmitting adequate CW after many years of phone operation). My knowledge has not helped me in any way to conduct a two way communication over a commercially built transceiver. No one has ever questioned my knowledge over the radio as a pre-requisite to talking to me.*

*So why should we expect an influx of new blood into the "fraternity" to continue laying claim on portions of radio spectrum. I sincerely hope I am wrong, but do we have anything at this stage to offer as inducement to younger generations to join our ranks? The temptations within the reach of this new generation in computer and telephone communications are hard to counteract if it means that serious studies have to be done for something that is already available to masses without any need for exams.*

*Do I need an "Optus" examination before I am allowed to transmit on the digital network to my friends in Europe?*

*Do I need to be able to make a FET Rf amplifier before being able to contact bulletin boards?*

*Yes I know it all costs money, but so does our hobby. And there are no propagation,*



TVI, neighbor, Local Council Development Applications (and complications) - for antenna installation and XYL problems.

Please do not misunderstand me. I still like the hobby although after so many years the novelty has faded and I am not as active as I wish to be (thank you sunspots!). I just feel that the regulations for entry into the ranks have to be drastically restructured and simplified to the following levels:

1. Morse code 5wpm (to keep bureaucrats and purists satisfied).
2. Thorough knowledge of Q codes.
3. Knowledge of operating procedures
4. One class licence - the present requirement for a Novice should be sufficient as the final threshold.
5. Good knowledge of antenna systems, and propagation.

This would still separate the chaff from wheat and keep our electronic geniuses from the feeling of being surrounded by a sea of electronic nincompoops.

And do not forget - the whole idea was (and still is) to communicate.

73 s, Michel Kostovic, VK2VBL

**There are those who would say that the idea is not to communicate but to experiment, probably it's a bit of both with communications taking the lead.**

**Either way it does not offer a real solution to the diminishing ranks...**

Editor

#### ...AND AGAIN

I fit into the category of newcomer to Amateur Radio, as I have become interested in it through my hobby with computers. Your editorial in the September edition of *Amateur Radio Action* asks what do I think needs to be done to encourage young people (or anyone) to become interested in the hobby.

First of all, a little background on me. I am a 52 year old Head Teacher of Vehicle Painting, who is a self-taught computer enthusiast, and last year took my family on a trip to the USA. Whilst there I decided to buy some good quality walkie talkie radios for personal use. Not knowing anything about Amateur Radio, I purchased two Icom 4 SAT handheld radios. When I came home I couldn't even charge them up properly and so they sat on a shelf for six months. Through my work I finally found someone who offered to help me with them. When he saw them he told me they were not walkie talkies, but amateur radios. Through him I found out that I needed a licence to operate them and also what these radios were capable of. eg...being able to link my computer by radio instead of using a phone and modem like I was doing, so naturally I became excited about the prospect of packet radio.

No problem I said, as I had already outlaid the money and naturally wanted to be able to

use the equipment legally.

This is where the trouble started.

I found out, like everyone else, that you have to sit for a minimum of three exams to become a Novice operator. The Regulation exam, the Radio theory and a Morse code test of five wpm. So I found an Amateur operator and he offered to help me with this task which I now study with him every thursday night. Now I am a busy man with my own teaching to do and I understand that one needs to know the regulations before going on air, but no one can convince me that I need to know much else, because like most people, young or old, I want to use the radio, I don't want to know how to build one. This seems to be the main problem that even most licenced amateurs will admit. Maybe a few radio home brewers will argue with me about this point, but let's face it, you can buy really good equipment these days that won't produce the problems that they have encountered and probably enjoy fixing, or even if we do, then we will happily pay someone to fix it for us. The whole thing seems to evolve around some sort of ethic, that says, well we had to do it and so should you. There are parts in the theory that one needs to know about causing interference etc, but the rest of it is totally outdated and totally unnecessary. This is the same way that computers started a few years ago. Just about every computer course tried to teach people how to program them, and this turned a great many people off them forever, because all they wanted to do was drive the car, not pull the engine apart.

This is what is happening to Amateur Radio.

Morse code: Why the hell do we newcomers need to know this? I already have computer programs (freely available as shareware) that allow my computer to interpret morse code into writing on the computer screen, and in the case of an emergency, a computer program that allows me to type directly onto the screen and with the touch of a button have it sent out in Morse code, perfectly keyed. Now I find out that even when I get my Novice license, I will still not be able to use my radios because I will need a full call license as they operate on UHF.

You are asking me what needs to be done to attract newcomers? Well that's easy. REMOVE THE RIDICULOUS AND OUTDATED BARRIERS to this wonderful hobby.

Keep these barriers for a certain class of licence, like a radio home brewer, if you wish, but give the newcomers a regulation test and a license to operate and do it quick. I have already heard licenced Amateurs say that hardly anybody is using 70 cm and I know because I listen to it, but can't legally use it because of outdated barriers that are relics of yesteryear. Does anyone have to sit down and do a mechanical examination before they are granted a licence to drive a car? Do like

the Americans have done and have no Morse licences, but go even further and remove all the outdated examinations that are irrelevant.

All that is needed these days is a test on the Regulations and the payment of a suitable licence fee.

One more thing, I have heard from licenced Amateurs is that they are worried about CB operators (known as Criminal Band I'm told) being able to use Amateur Radio because of the language and so on that goes on in that band. Well isn't this the purpose of the W.I.A. or the S.M.A. to weed out people who are inclined this way? This may be able to be done by having the radios themselves automatically transmit their serial number (in Morse code if you like) so that an offender could be traced quite easily. This of course would require all licencees to submit this information at the time of procuring the licence and having the radios manufactured to perform this task automatically, surely the technology exists. I for one like the hobby immensely, but am being gradually turned off by what is involved to gain a licence to simply press a button and talk to someone else who has similar equipment.

Thanks for the opportunity to let me have my gripe, and even if you think this letter is not worth printing, then don't worry as I shall still buy my monthly copy of *Amateur Radio Action* because I like it.

I'd also like to think that this letter may help to change things, but unfortunately, I doubt it.

Regards, Bob Adlington,  
Matraville, NSW 2036

**Like it or not, of the many letters received - from both amateurs and would-be amateurs such as Mr Adlington, I believe that he is representative of the view held by many. I certainly do not endorse all the points made in his letter - but, sadly, I believe that this is how amateur radio is seen by many - elitist in the extreme. This does not mean that we should simply remove the requirements and open the flood gates to anyone who can afford a licence - God help us all if amateur radio ever becomes just another form of CB, but, the question remains - what do we do to attract newcomers, particularly today's children and teenagers?**

**Mr Adlington has told us some of the problems - can anyone out there supply some realistic answers?**

Editor

#### INTERNET TO BE REGULATED

Sorry about that Newsdesk article - but we couldn't resist - actually it should appear in April, on the first of that month to be precise - it is merely a hoax which appeared on Internet and got a whole lot of people really steamed up, how about you...



Paul Butler reviews the...

# ELECTRONIC WORKBENCH

**"And don't expect to be able to share the cost of Electronics Workbench amongst your friends with the aim of getting a copy each..."**

**L**ast month in Here and There we had a look at EasySim, a digital electronics simulator for IBM-compatible PCs. The producers of EasySim, a Melbourne company called Research Systems, recently released the version we reviewed, which addressed some of the limitations of the original version. Our conclusion was that EasySim is an excellent educational tool for people interested in starting out in digital electronics, particularly in an amateur examination or school context.

This month, it's the turn of **Electronics Workbench**, a software product from Interactive Image Technologies of Toronto, Canada. It is not our intention to compare this with EasySim — the two software packages are aimed at different levels of use. The two packages are similar, however, in providing a computer simulation within which electronic circuit designs can be built and tested with ease and at minimal cost.

In the words of the software authors...

*"Electronics Workbench allows the user to:*

- construct a schematic for an electronic circuit on a computer display;*
- simulate the activity of that circuit;*
- display its activity on test instruments contained within the program; and*
- print a copy of the circuit, the instrument readings and the parts list.*

*It has separate modules for analogue and digital circuits; the size of the circuit is limited only by available memory and the time a user will wait for results."*

Let's make it quite clear — Electronics Workbench is not

cheap. It is a fully-functional circuit simulator, well-designed and aimed at the high-level user. A professional electronics designer would certainly make full use of the facilities on offer, as would an educational institution offering electronics courses. An amateur radio enthusiast would certainly have to think very carefully before shelling out the necessities on Electronics Workbench but they would certainly get value for money.

And don't expect to be able to share the cost of Electronics Workbench amongst your friends with the aim of getting a copy each. Electronics Workbench comes with a bit of hardware affectionately known as a 'dongle'. This plugs into the parallel port of the computer and, without it, nothing works!

That's the end of the warnings. Now into the Electronics Workbench program itself. And *what* a program...

The start-up screen presents the user with a blank breadboard (the **workspace**), a shelf of test instruments, a bin of components and some controls to make the whole thing go.

The **parts bin** contains as many of each component as you can fit onto the workspace, which itself extends to the area of about three by three screens. The whole thing wakes up in either analogue or digital mode, depending on your startup command, and the contents of the parts bin and the test instruments shelf depend on the mode selected.

The digital module offers an unlimited number of gates and flip-flops, for example, including AND, OR, XOR, NOT, NAND, NOR and the half-adder. You also have access to:

- a **multimeter**, which acts only as a digital voltmeter in the digital simulation (why would you be interested in current and resistance in a digital circuit?);
- a **word generator**, which is used to send patterns of bits (binary digits, 1s and 0s) to your circuit. A **clock** output is available from the word generator and, after each clock cycle, the device moves

on to the next set of values preset by the user. An analysis is performed for each half of the clock cycle (a 1 followed by a 0), so 16 sets of values can provide 32 simulations.

- a **logic analyser** for displaying TTL logic levels around the circuit. This is implicitly connected to the clock, since its display must be synchronised to the output of the word generator.

- a **truth table / symbolic converter**, which converts logic circuits to logic gates, truth table representation and Boolean expressions. This is a device not available in real laboratories — it even takes a Boolean relationship and converts it into a circuit for you!

Things are different in the analogue module. Now you have passive components such as resistors, capacitors, inductors, bulbs and LEDs; active components, including NPN and PNP transistors, diodes and zeners; and AC and DC sources. The parts bin offers unlimited numbers of voltmeters and ammeters, while on the test instrument shelf you have:

- a **digital multimeter**, for measuring current, voltage, resistance or decibels;
- a **function generator**, which produces sine, square and triangular waveforms ranging in frequency from 1 Hz to 999 MHz (DC to daylight?);
- a standard **dual-beam oscilloscope** (missing from EasySim, as observed in last month's review);
- a **bode plotter**, which shows the ratio of output signal to input signal against frequency, invaluable for investigating the performance of, say, a bandpass filter.

A powerful feature of Electronics Workbench is the **macro** function. The user can build a circuit within either the digital or the analogue module, then save it as a macro. This then appears in the parts bin for subsequent inclusion in further circuit building, complete with its own terminals for connection to the outside world. Once on the workspace as a named symbol, the macro can be



zoomed and edited within a circuit, providing amazing flexibility for circuit development.

Electronics Workbench requires a mouse for its operation. Components are picked up from the parts bin and placed onto the workspace using the mouse. Connectors are then added and connecting wires are pulled out to link components together.

Test instruments are lifted off the shelf and wired into the circuit as icons. Each icon can then be zoomed, using the mouse or a function key, so that its face can be read. Adjustments are made on the instrument face, just as you would adjust the controls of a real oscilloscope or function generator.

Let's go quickly through the Menu to see what functions are available (most menu items can be selected using a function key).

**F1** provides context-sensitive help in a simple hyper-text form — if you do not know what highlighted key words mean, simply click on them to jump to another Help page with an explanation.

**F2** (Cut), **F3** (Copy) and **F4** (Move) are used after selecting components with the mouse. Multiple components can be selected for cutting, copying and moving. **F5** is the macro control already mentioned.

**F6** offers a label function, so components can be named or, more importantly, assigned a value. Components can even be labelled in the parts bin, so multiples of the same component can be generated. It seemed odd during the review that values of resistors and capacitors were not limited to the standard preferred values obtainable from component stores; why would you label a component with other than a preferred value? And further, when would you use values expressed to 2 decimal places (eg 10.00 ohms)?

**F7** is the zoom function. Using this function key, you can enlarge the face of any of the test instruments included in a circuit, to set the controls or read the display. Pressing **F7** a second time shrinks the enlarged face back to the equivalent test instrument icon. A double click of the mouse on the icon in the circuit has the same effect as pressing **F7**.

Any component can be rotated with the use of the Rotate function key, **F8**. This allows the use of standard drafting conventions when drawing a circuit on the workspace. File management is handled through **F9**, which provides access to loading and saving circuits or customised parts bins. **F10** allows the user to set preferences throughout Electronics Workbench — whether a grid is displayed on the workspace, for example.

A **print** function is available though the Menu. The software supports a range of over 150 dot-matrix and laser printers, selectable through a scrolling list. The final schematic to be printed can be labelled before the printing process takes place.

Once a circuit has been built, the user can test its properties by turning on the power switch. Some circuits will run for a while, producing an oscilloscope trace, for example, then automatically stop. Others will run indefinitely, and so need to be stopped, or not run at all if the circuit design is flawed! Making any change to the circuit automatically switches the power off — if only we had this feature in a real-world electronics laboratory, we might have fewer electric shocks...

The manual which accompanies Electronics Workbench is very clear and well-structured. There are two tutorials, one for each of the analogue and digital modules. These take the user step by step through building a simple circuit, introducing the main functions in an easy-to-follow way. There is then a reference section which gives full details of every function offered by the software.

Reading the manual alone provides an education in electronics, since there are many advanced features of the software which the average electronics enthusiast would rarely encounter in the real world! Electronics Workbench even provides the user with access to the Help files, so that these can be customised for individual use.

This seems at first rather odd, since if you can understand the product enough to customise the Help files, you presumably do not *need* the Help files!! However, the software authors are not *really* stupid — the customised Help can be set up as the basis of a series of interactive lessons. A menu can offer a series of lessons; a button on a screen can call up a customised entry at any point. Components can be renamed at will using the same editing function.

This is a very clever piece of software. It provides easy access to standard analogue and digital components and test gear, as well as more sophisticated equipment than you would find in the average amateur's shack or a typical educational environment. The fact that there are unlimited components available is excellent; couple this with the macro function and you have a simulation limited only by your own imagination.

I could see, for example, an experimenter setting up a circuit with 'best guess' components and playing around with their values until the circuit performed to specification. The circuit in its

final form could then be printed out and transferred to real life. Presumably the simulation behind Electronics Workbench would be good enough to give the right answer to circuit design problems.

Electronics Workbench requires an IBM-compatible computer with 640KB of RAM, MS-DOS 3.0 or higher, at least 2MB of hard disk space for full installation, an EGA or VGA display and a Microsoft-compatible mouse. It is produced by Interactive Image Technologies.

The review copy of **Electronics Workbench** was kindly supplied by **Edsoft**, Australian Educational Software Suppliers, PO Box 314, Blackburn, Victoria 3130.

### THE CONTINUOUS TRAVELLING-WAVE ANTENNA

In Here and There recently, we've had a look at vertical antennas and discussed the concept of antenna resonance. The conclusions from our investigations were:

- an antenna is effective only if it is resonant at the frequency in use;
- a resonant antenna will present the correct impedance to the feed line which provides the radio-frequency (RF) energy to it;
- a resonant antenna plus feed-line will provide a SWR close to 1 at the transmitter end of the system; and
- using an antenna tuner to make the SWR equal to 1 does not guarantee a resonant antenna; in fact, it may mask a poor radiator.

Now, how about a simple vertical antenna which will resonate at *every* frequency you choose to use, from 1.8 MHz up to 30 MHz? And that's *all* those frequencies, not just the ones that are harmonically related and fall within the amateur bands. No tuning, no adjustments, no traps that can deteriorate and fail. No ground plane either — just a block of wood to rest it on and a few guy ropes to hold it up.

Too good to be true?

Well, the antenna *does* exist and it's called a **Continuous Travelling-Wave (CTW)** antenna. The version I've had for a few years is the **Black CTW** antenna, and it's been around for so long that its makers seem to have disappeared. However, the concept is still a good one, so let's have a closer look at the CTW antenna...

The CTW antenna is essentially a long piece of metal tubing. Most commonly, it would be made from hollow aluminium tubing. This can range in length from 33 feet to 39 feet, according

....



to the basic instruction sheet that came with my Black CTW antenna.

The diameter is typically 1.5 inches for the shorter antenna, going up to 2 or 3 inches for the longer antenna.

The dimensions are quoted in feet and inches here because that's how they are in the information to hand (I said it had been around for a while!).

If getting hold of a single piece of tubing is difficult, try two 16 foot lengths, joined by a short section of the same diameter, split along its length.

A couple of hose clamps can then be used to hold the whole thing together.

The instructions clearly state that you must *not* use anodised aluminium. Electrical connections would be difficult using this material.

The key component for this type of antenna — and the most expensive part — is a mysterious white plastic unit which straps onto the side of the tubing at the base of the antenna and matches the transmission line from the transceiver to the antenna itself.

It is this matching unit which does all the marvellous work in keeping the antennas resonant — all the way from 1.8 MHz to 30 MHz!

In an earlier version wires emerged from this unit, and these were connected to the antenna; a standard coaxial socket on the bottom of the unit provided the connection to the coaxial cable to the transceiver.

A later modification changed these wander leads into sockets, into which the connections from the antenna were plugged.

The aluminium tubing is mounted vertically, with one end resting on an insulator to avoid electrical contact with the ground.

This can be a chunk of wood or rubber — I used a wooden block with a recess cut out, into which the antenna was placed.

A set of two of three tent guys and pegs holds the whole lot up. The wind resistance is very low, so an elaborate guying system is not called for.

A connecting wire runs from the matching unit to the lower end of the aluminium antenna, secured tightly and preferably waterproofed.

A second wire starts off from the other terminal of the unit and runs freely all the way up *inside* the antenna tubing to the very top.

It is secured at this point and also waterproofed.

These wires are supplied with the Black CTW kit but no doubt any decent wire would do the job.

The top of the aluminium tubing has a cap fitted to prevent rainwater entering the tube and contributing to corrosion.

The antenna I have used matches to a 50 ohm feedline. This can be a 50 foot length of RG58.

One of the tips given if the SWR is not all you wish for on installation is to alter the length of the feedline slightly by adding or subtracting a few feet.

This avoids problems associated with the feedline itself resonating at some frequency or other, just because it happens to be some simple multiple of the wavelength in use.

And that's it — simply connect your transceiver and away you go.

The recommendation is to avoid the use of an antenna

tuning unit. It should not be needed, since the matching device handles all that sort of thing. The unit has been swept in frequency from 1.8 to 40 MHz and should offer a 50 ohm impedance over that range.

The feedline should fall away from the feedpoint and ideally should be buried. It can pick up radiation from the antenna itself and this will affect the operation of the system. No point of the antenna should be earthed.

The Black CTW antenna used for testing is rated at 600 watts PEP and can safely handle voice SSB and normal CW transmissions.

For heavy-duty cycle modes such as packet, radioteletype and AM, the power level should be maintained at a much lower value. This should not be a problem, since most contacts in such modes can be made quite effectively with less than 100 watts.

Does it work?

Well, the installation I used presented a decent SWR over the specified range, meaning that band-switching was a breeze. The location of the original set-up, however, had a phenomenal amount of RF noise generated in the vicinity.

This did not seem to be associated with any motors, pumps or other electrical gadgets nearby.

Even a visit on request from the friendly local radio inspector did not unearth anything, although it was pointed out that he could not spend a lot of time playing detective to try to find the source of the RF interference (RFI). Vertical antennas are known for their efficiency in picking up local noise, too.

It is hard at this point, therefore, to give any definitive figures for the performance of the Black CTW antenna.

The next stage will be to move the antenna to a quieter location (in the RFI sense) and run some more extensive tests.

All being well, it will end up close to the Hustler trap vertical reviewed a month or two ago in Here and There. Then we can make some direct comparisons and report them in a future edition.

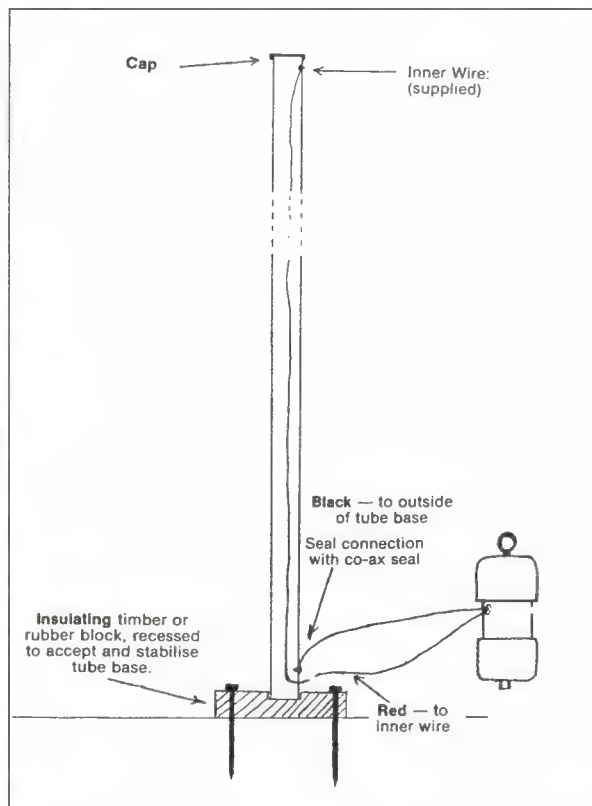
Meanwhile, what would be interesting would be to locate CTW antenna users and hear from them about their experiences, good or bad. Also, whatever happened to the makers of the Black CTW antenna?

Are you out there?

If so, Here and There would love to hear from you...

That's all for now from Here and There. We hope there is something for you in these pages; if so, why not write and let us know.

Cheers and 73 from Paul, VK3DBP.





**W**elcome to the second edition of *Gone Tropo*. If you missed last month's, you are probably baffled as to the intention of this column. Briefly, I intend to emphasise VHF (beyond 50MHz) activity, special events and generally provide a compilation of reports from around the country on conditions, new station records, intended field operation and special path attempts, etc.

If you *did* respond to last month's invitation to submit details on your own activity and so forth, bear in mind that you were probably reading my first column while this second one was being finalised. Stick with it — a 'pipeline' effect will soon take place with a steady stream of information to keep your curiosity replete. Incidentally, I failed to suggest it last month but, I am open to you ringing me with any suggestions or tidbits you might have. If you ring me during business hours and I am tied up, I will ring you back promptly. My business hours phone number is 018 62 5027.

A quick chat with Roger, VK5NY, confirmed that the rather poor VHF conditions which characterised July and August, here in Canberra, were similarly prevalent in South Australia. Roger tells me that the local 10GHz enthusiasts (himself, as well as Bill VK5ACY, David VK5KK and Chris VK5MC) are all involved in keen experimentation. Trevor VK5NC has equipment in the pipeline as does Mark VK5EME. These early experiments are all dress-rehearsals, of course, for the *ultimate* contact across the Great Australian Bight to WA.

The trepidation and excitement of this potential contact is, of course, likely to have some of its shine removed if N6CA and his colleagues are successful between Hawaii and mainland USA.

The northern summer, vital for the required duct between the US mainland and Hawaii, is near its end. Perhaps 10GHz across our Great Australian Bight will be accomplished with international acclaim for distance before our thunder has been stolen elsewhere.

News regarding the Mt Gambier beacon sees it somewhat akin to our Canberra beacon situation: technically all dressed up with nowhere to go. The days of light-heartedly being given space atop a landmark or tall building are gone. The sites we admire for height and outlook are often already well crowded with numerous commercial services. The simple alternative of siting a beacon at the home of a hospitable local solves one problem and creates another if you happen to live on the beacon's doorstep.

Ron, VK3AFW, maintains a regular morning schedule on 144MHz with Andrew VK7XR. Conditions vary from marginal CW contacts to peaks permitting SSB contacts. Roger VK3XRS often participates during these contacts, finishing off with Des VK3CY joining the net to work the long haul from Wedderburn to Bairnsdale. Ron

### The column for those interested in VHF (beyond 50MHz) activity...

is also a regular on Saturdays and Sunday mornings with his effective CW signal often heralding openings on 144MHz.

Chaz, VK3BRZ, has tamed his AM17 amplifier (complete with well-choreographed sequencing) and is a very strong signal into Canberra on 144MHz and, on some occasions, into Sydney. Chaz runs less power on 432MHz but more antenna gain, and has managed on some paths to surpass his 144MHz performance.

There have been quite a number of old faces making an effort to keep the bands boiling. Doug VK3UM has made a few appearances on 144MHz followed by his usual big signal on 432MHz. Gil VK3AUI has appeared regularly, although my incomplete antenna system for 432MHz has limited activity between us to 144MHz. Roger VK3XRS is pretty well perennial in his reliable path to Canberra, with perseverance paying off to reap contacts into Sydney. Norm VK3DUT manages an occasional weekend appearance with a big improvement in signal strength on 432MHz due to a little more horsepower.

Sydney activity, during the annual holiday absence of Gordon VK2ZAB,

has been stimulated mainly by Mike VK2FLR. Conditions have not been brilliant in terms of residual tropo to Canberra, however changes in signal strength over this short path have been dramatically pronounced during certain aircraft movements with barely copyable signals reaching strength nine for extended periods. Gordon VK2ZAB returned from his annual sojourn to his dutiful role in warming the troposphere for subsequent use by others each Saturday and Sunday morning. Also active on the weekends in Sydney has been Allan, VK2DXE, who is forced to flee the bands as early as 0830k due to work commitments, but is slowly moulding his station in terms of equipment and antennas to become a force to be reckoned with. Chris VK2YUS has a good signal here in Canberra, and was recently heard working Ross VK2DVZ at Taree. Norm VK2ZXC at Port Kembla has had bursts of activity with a few VK3 stations kicking themselves for not getting out of the cot early enough to work his unique grid square. Also sought on the grid square front are Fred VK2YZU, Mark VK2EMA and Paul VK2WPT in central NSW.

That has been about the extent of my research and first-hand knowledge of activity and band conditions over the last two months. Please be wary of allowing descriptions of poor conditions to sway you. Let me remind you of how different things can be and indeed how juxtaposed they were this time last year.

Two good openings took place between VK1/VK2 and VK5 on 144MHz for two days in June and July 1993. During October there was a 12-hour opening on 144MHz and 432MHz, and stations in Sydney worked into many spots including Melbourne, Canberra, Kangaroo Island, Adelaide and McLarenvale (south of Adelaide).

During these dramatic openings, exponents of the 'read the weather map' school were able to confirm years of unproven theory as these dramatic ducts were textbook examples. This year, our summer conditions were pretty lack-lustre and winter has been characterised by numerous high pressure systems either too far south or too far inland, with no stations strategically placed to take advantage of them.

Be patient and keep trying — your efforts *will* be rewarded.

Meanwhile, good DX!



## ENJOY THE HOBBY OF AMATEUR RADIO

EDUCATION SERVICE  
W.I.A. (NSW Division)  
TELEPHONE (02) 622 2040

### NOVICE STUDY KIT - \$28 inc. postage.

Includes Into Electronics, Novice Electronics, 1000 Questions, Learning Morse Code Kit with 3 cassettes, and the Novice Handbook with syllabus, regulations, and general information.

### NOVICE KIT WITHOUT MORSE CODE - \$17 inc. postage.

### INTO ELECTRONICS - \$5.50 inc. postage.

An introductory theory text suitable for club and school classes covering the fundamentals of electricity and how it is used.

### NOVICE ELECTRONICS - \$5.50 inc. postage.

An easy to follow text that extend from Into Electronics to a complete Novice theory course, covering all syllabus topics.

### 1000 QUESTIONS AND ANSWERS - \$5.50 inc. postage.

A collection of typical exam questions covering all areas of Novice theory and regulations. A must for the Novice candidate.

### LEARNING MORSE CODE PACK - \$11.50 inc. postage.

Three 60 minute Morse cassettes with 120 programmed steps keyed to a comprehensive text and spoken prompts. Letters, numbers, and sentences at 5WPM for Novice standard Morse.

### NOVICE SUPPLEMENT - \$4 inc. postage.

Syllabus, Study Guide, Regulations, and useful information.

### 100 PROJECTS - \$5 inc. postage.

Simple, cheap, well explained electronics projects for High Schools and hobbyists, using common components.

### MORSE CODE CASSETTES - \$4 inc. postage.

60 minute Morse tapes at any speed from 5 to 30 WPM, three versions of each available. Specify speed when ordering.

### 500 QUESTIONS AND ANSWERS - \$5 inc. postage.

A collection of typical exam questions that serves to bridge the gap between Novice and Full Call examination standard.

- These services are provided voluntarily by radio Amateurs.
- Above prices include postage anywhere in Australia.
- Bulk prices (10+) available on request, buyer to pay freight.
- Registered business address 19 Lancaster St, Blacktown, 2148

IAN HOOK  
EDUCATION SERVICE  
P.O.Box 262, RYDALMERE, 2116  
Telephone: (02) 622 2040

|                     |         |                          |                    |        |                          |
|---------------------|---------|--------------------------|--------------------|--------|--------------------------|
| Novice Study Kit    | \$28    | <input type="checkbox"/> | Morse Tapes        | \$4    | <input type="checkbox"/> |
| No-Morse Novice Kit | \$17    | <input type="checkbox"/> | Speed (WPM)        |        |                          |
| Into Electronics    | \$5.50  | <input type="checkbox"/> | Novice Electronics | \$5.50 | <input type="checkbox"/> |
| Morse Code Pack     | \$11.50 | <input type="checkbox"/> | 100 Projects       | \$5    | <input type="checkbox"/> |
| 1000 Questions      | \$5.50  | <input type="checkbox"/> | 500 Questions      | \$5    | <input type="checkbox"/> |

NAME: .....

ADDRESS: .....

.....POSTCODE: .....

# OUTBACKER™

H.F. Mobile Antenna

1.8 TO 30MHz

★ All bands on one whip

Or Custom made to your requirements.

★ No tuner required

★ Low v.s.w.r.

NEW  
INFO  
VIDEO

Send \$ 5.00 for a 15 minute informational video.  
Refundable with purchase

Rugged - Reliable - Dependable

TERLIN AERIALS  
5 Yampi Way  
Willetton W.A. 6155

Ph (619) 3545444  
Fax (619) 4577737

## IAN J. TRUSCOTT'S ELECTRONIC WORLD

30 Lacey Street, Croydon, 3136. Phone (03) 723 3860  
24 Langtree Ave, Mildura, 3500. Phone (050) 23 8138  
Fax: (03) 725 9443. Mail & Credit Card Orders Welcome

We stock an extensive range of semiconductors, FETs & Mosfets, power & zener diodes, SCRs, Triacs, Linear ICs, 74LS/HC & 4000 series ICs, high-intensity LEDs and displays.

Accessories inc. pots, trimpots, RF chokes, voltage regulators, relays, fuses, globes & heatsinks, as well as a comprehensive range of popular switches, knobs, plugs & sockets. We offer a huge range of resistors, capacitors & popular parts at competitive prices.

Rechargeable batteries, incl. regular, tabbed, rapid charge & back-up types are available ex stock. Ring for a price on our sealed lead-acid, video, cellular phone & watch batteries.

We now offer a speedy, courier delivered, mail order service.

### KITS

- 50 mg digital frequency meter kit. \$85
- In circuit SCR, diode & transistor tester kit. \$15.95
- Speech processor for transceivers \$36.95

### MULTIMETER SPECIALS

- Beckman DM2 \$69 inc tax
- Beckman DM10 \$119 inc tax

Don't forget our disposals store at Sth. Croydon.

There's plenty of hard-to-find parts and  
help you won't get elsewhere!

Phone 723 2699 (ask for Nigel)

L T089.ARA



# DICK SMITH ELECTRONICS



**HUGE  
Savings on  
EX-Demo Gear!**



**On-Air  
Demonstrations  
Plenty Of  
on-Site Parking**

# OPEN DAY!

**Saturday 12th November 1994 Only**

- Special Prices on new and ex-demo equipment, with some items below cost!
- A selection of transceiver and accessory samples at unbelievable prices, many with warranties!
- Qualified Amateur Staff for advice and assistance
- Huge range of all the latest
- Yaesu equipment on display, plus a large range of antennas and accessories
- Bring your licence with you for On-Air demonstrations
- It's under cover, so come along rain or shine!
- Light refreshments available
- See a selection of great value IBM compatible computers

## **SUPER SAVER HOTLINE Ph: 1-800 226610 FREE CALL**

The easy way to save! Just phone us on our toll-free number between 9am and 4pm (Sydney time). We'll quote you our Open Day Special Price on new or ex-demo equipment. Simply quote your credit card number and we'll forward your purchase promptly to you. (Post and packaging extra).

CNR. Lane Cove  
& Waterloo Roads,  
NORTH RYDE,  
SYDNEY  
Ph:(02) 878 3855

**WATERLOO ROAD**

**YAESU OPEN DAY UPSTAIRS**



**LANE COVE ROAD**

B 1797



# Mobile Or Base, See Us For Trans

## Yaesu FT-840 HF Transceiver

Blending the high-performance digital frequency-synthesis techniques of the FT-890 with the operating convenience of the FT-747GX which it replaces, the all new FT-840 HF mobile transceiver sets the new standard for high performance in affordable transceivers.

Covering all HF amateur bands from 160m-10m with 100w P.E.P. output, and with continuous receiver coverage from 100kHz to 30MHz, the FT-840 provides SSB/CW/AM operation (FM optional), 100 memory channels, a large backlit LCD screen, two independent VFOs per band, an effective noise blanker and an uncluttered front panel, all in a compact case size of just 238 x 93 x 243mm (WHD).

Unlike some competing models, small size doesn't mean small facilities. The FT-840 provides easily-accessible features such as: Variable mic. gain and RF power controls, SSB Speech processor for greater audio punch, and IF Shift plus CW

Reverse to fight interference. Dual Direct Digital Synthesizers ensure clean transmitter output and fast Tx/Rx switching, while the low-noise receiver front-end uses an active double-balanced mixer and selectable attenuator for improved strong signal handling. The FT-840 weighs just 4.5kg and uses a thermally-switched cooling fan, surface-mount components and a metal case for cool, reliable operation. An extensive range of accessory lines are available, including the FC-10 external automatic antenna tuner, so you can customise the FT-840 to suit your operating requirements.

Cat D-3275



NEW FOR '94



**\$1895**

**2 Year Warranty**



NEW FOR '94



**\$699**

**2 Year Warranty**

## FT-2200 2m Mobile Transceiver

The new FT-2200 is a compact, fully featured 2m FM transceiver providing selectable power output of 5, 25 and 50 watts, and includes the latest convenience features for more enjoyable mobile or base station operation. Built around a solid diecast chassis, it provides 49 tunable memories, a large variety of scanning modes, an instant recall CALL channel, 7 user-selectable channel steps from 5kHz to 50kHz and is just 140 x 40 x 160mm (not including knobs).

Backlighting of the large LCD screen, knobs and major buttons is even automatically controlled to suit ambient light conditions. Also provided is a 38 tone CTCSS encoder, DTMF based paging and selective calling with Auto-Page/Forwarding features, and 10 DTMF auto-dial memories. The LCD screen provides a highly legible bargraph Signal/P.O. meter plus indicators for the various paging and repeater modes. An optional internal DVS-3 digital recording/playback board can also be controlled from the front panel, giving even greater messaging flexibility. Supplied with an MH-26D8 hand microphone, mobile mounting bracket and DC power lead.

Cat D-3635

## FT-5200 2m/70cm Mobile Transceiver

The FT-5200 uses the latest innovations in compact cross-band full-duplex and detachable front-panel design for brilliant mobile performance. It has 32 tuneable memories, a built-in antenna duplexer, dual full-frequency LCD screen (with signal strength/power output bargraphs for each band), 8-level automatic display/button lighting dimmer and dual external speaker jacks (one for each band.) A thermally-activated fan allows up to 50 watts output on the 2-meter band and 35 on the 70cm band. Plus, scanning features include programmable scan limits, selectable scan resume modes, memory skip, priority monitoring and one-touch recall CALL channels. In addition, 6 user-selectable channel steps are provided and a FRC-4 DTMF paging selcall option lets you program a three-digit ID code so you can be paged by other transceivers, or page up to 5 other stations yourself. An optional YSK-1 remote panel lets you relocate the main rig (under the front seat, for example) and mount the control panel on the dash. The FT-5200 comes with hand-mic, mobile mounting bracket and DC power lead.

Cat D-3310

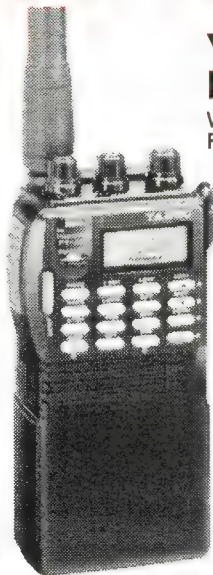


**\$1499**

**2 Year Warranty**



# Receivers And Accessories First!



## Yaesu FT-415 Deluxe 2m Handheld

While stocks last, grab a deluxe FT-415 at a great bargain price.

- 144-148MHz Tx, 140-174MHz Rx
- 41 memories, 2 VFOs
- Keypad frequency entry
- Selectable Auto Repeater shift (VK version)
- DTMF paging, variable Auto Battery Saver, Auto Power off, VOX, DC power socket
- Complete with ultra long life 1000mA/H NiCad (2W RF out), carry case, belt-clip and AC charger

Cat D-3610  
**Only \$529**  
**2 year warranty**  
**Hurry! Limited Stocks!**



## Rugged HF 5-Band Trap Vertical Antenna

The rugged 5BTB is a 5-band HF trap vertical which continues the Hustler tradition of quality and performance. It incorporates Hustler's exclusive trap design (25mm solid fibreglass formers, high tolerance trap covers and low loss windings) for accurate trap resonance with 1 kW (PEP) power handling. Wideband coverage is provided on the 10, 15, 20 and 40m bands (SWR typically 1.15:1 at resonance, < 2:1 SWR at band edges) with 80kHz bandwidth typical on 80m at less than 2:1 SWR. An optional 30m resonator kit can also be installed without affecting operation of the other bands. High strength aluminium and a 4mm (wall thickness) extra heavy-duty base section guarantee optimum mechanical stability. At just 7.65m, the 5BTB can be ground mounted (with or without radials, although radials are recommended), or it can be mounted in an elevated position with a radial system. Unlike other antenna designs, the 5BTB can be fed with any length of 50-ohm coax cable.

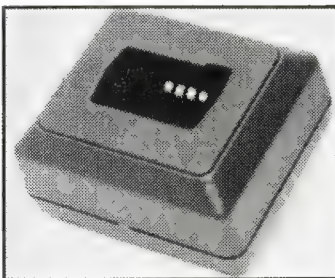
Cat D-4920



**\$299**

## MasterCharger 1 Fast Desktop Charger

New for '94! At last, an intelligent, fast desktop charger that not only suits most current Yaesu handhelds but also many previous models. Made in USA, the MasterCharger 1 operates from 13.5V DC and uses switch-mode technology plus a Philips battery charge monitor I.C. (with -ΔV full charge detection) to correctly fast-charge NiCad batteries between 6V and 13.2V, then switch to a trickle charge. Suitable for the FT-23/73, FT-411/411e, FT-470, FT-26, FT-415/815 and FT-530, its charging cradle can easily be replaced, allowing for the insertion of a new cradle to suit earlier Yaesu transceivers (eg FT-209R) or different brands/model handhelds. The MasterCharger 1 requires 12-15V DC at 1.3A, and is supplied with a fused cigarette lighter cable for vehicle use. Cat D-3850

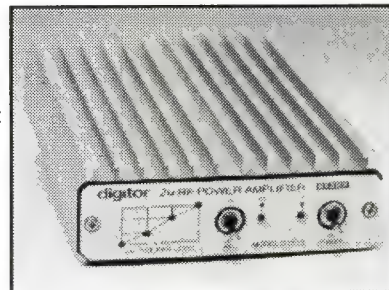


Now available - charging cradles to suit various Kenwood, Icom, and Alinco handhelds.

**\$169<sup>95</sup>**

## 2m RF Power Amplifier

Boost your 2m hand-held's performance with this compact amplifier. Works with 0.3 to 5W input and provides up to 30W RF output, plus has an inbuilt GaAsFet receive pre-amp providing 12dB gain. A large heatsink and metal casing allow for extended transmissions at full output, and a mobile mounting bracket is supplied for vehicle use. Requires 13.8V DC at 5A max. Size 100 x 36 x 175mm (W x H x D).



Cat D-2510

**\$169<sup>95</sup>**

PHONE, FAX & MAILORDER SERVICE & YAESU BROCHURE HOTLINE

Outside Sydney (FREE Call) 008 22 6610

Sydney and Enquiries - (02) 888 2105

Fax: (02) 805 1986 or write to

Dick Smith Electronics, Mail Orders, Reply Paid 160

PO Box 321 NORTH RYDE NSW 2113

All major Credit Cards accepted. O/Nite Courier Available.

Yaesu stocks, some antennas and accessories are not held at all stores, please contact your local store for availability, or phone 008 22 6610

**digitor**

**NEW FOR '94**



B 1797

NSW • Albury 21 8399 • Bankstown Square 707 4888 • Blacktown 671 7722 • Bondi 387 1444 • Brookvale 905 0441 • Burwood 744 7299 • Campbelltown 27 2199 • Chatswood Chase 411 1955 • Chullora 642 8922 • Gore Hill 439 5311 • Gosford 25 0235 • Hornsby 477 6633 • Hurstville 580 8622 • Kotara 56 2092 • Liverpool 600 9888 • Maitland 33 7866 • Mid City Centre 221 0000 • Miranda 525 2722 • Newcastle 61 1896 • North Ryde 878 3855 • North Sydney (Greenwood Plaza) 964 9467 • Orange 618 400 • Parramatta 689 2188 • Penrith 32 3400 • Railway Square 211 3777 • Sydney City 267 9111 • Tamworth 66 1711 • Wollongong 28 3800 ACT • Belconnen (06) 253 1785 • Fyshwick 280 4944 VIC • Ballarat 31 5433 • Bendigo 43 0388 • Box Hill 890 0699 • Coburg 383 4455 • Dandenong 794 9377 • East Brighton 592 2366 • Essendon 379 7444 • Frankston 783 9144 • Geelong 232 711 • Highpoint 318 6300 • Melbourne City 399 Elizabeth St 326 6088 & 246 Bourke St 639 0396 • Richmond 428 1614 • Ringwood 879 5338 • Springvale 547 0522 QLD • Booval 282 6200 • Brisbane City 229 9377 • Buranda 391 6233 • Cairns 311 515 • Capalaba 245 2870 • Chermide 359 6255 • Maroochydore 791 800 • Mermaid Beach 785 600 • Rockhampton 27 9644 • Southport 32 9033 • Toowoomba 38 4300 • Townsville 72 5722 • Underwood 341 0844 SA • Adelaide City 232 1200 • Elizabeth 255 6099 • Enfield 260 6088 • St Marys 277 8977 • Westlakes 235 1244 WA • Balcatta 240 1911 • Cannington 451 8666 • Fremantle 335 9733 • Perth City 481 3261 • Midland 250 1460 • Northbridge 328 6944 TAS • Glenorchy 732 176 • Hobart 31 0800 • Launceston 344 555 NT • Darwin 811 977

STORES ACROSS AUSTRALIA AND NEW ZEALAND

\*MAJOR AMATEUR STOCKIST STORES SHOWN IN RED



# SUBSCRIBE NOW!!!



## ACP DIRECT CUSTOMER SERVICE HOTLINES

For any enquiries regarding your subscription or reader offers, please call us on:

260 0037 (Sydney callers)

1800 252 515 (elsewhere - FREE call)

Our lines are available

Monday to Friday (9am-5pm EST).

After hours: (02) 267 1088.

OR Fax us on (02) 267 4363

- 24 hours a day

OR Letters should be addressed to:

ACP Direct, GPO Box 5252,  
Sydney 2001.

L 083.ARA

## SUBSCRIBE NOW!!

- ☐ 1 Year (12 Issues, plus Yearbook) \$51.35
- ☐ 2 Years (24 Issues, plus 2 Yearbooks) \$92.45
- ☐ New Zealand 1 Year (Airspeed) A \$73.30  
(Airspeed) NZ\$90.20
- ☐ Overseas 1 Year (Airspeed) A \$94.80
- ☐ Cheque enclosed \$ ..... payable to ACP Syme Magazines
- ☐ Please charge my credit card
- ☐ Amex ☐ M/Card ☐ Visa ☐ B/Card

Expiry Date: ..... / .....

Signature: .....

Mr/Mrs/Ms: .....

Address: .....

Postcode: ..... State: .....

Telephone: (Work/Home) ( ) .....

Return to: ACP Direct  
GPO Box 5252,  
Sydney NSW 2001

ACP Syme Magazines  
ACN 064 335 619

amateur  
**radio**  
action



# DXCC COUNTRY LIST

This DX Country List was supplied by Bill Brelsford, K2DI with much of the information being supplied by Ron McConnell, W2IOL and it is arguably the most informative we've ever sighted.

We hesitate to think how many hours it took to compile but the end result is well worth the effort.

It is current as of 1 July and includes the addition of Eritrea (E3), deletion of Penguin Islands (ZS0) and Walvis Bay (ZS9), and prefix changes for Yemen, Malyi Vysotskij Island, Franz Josef Land as an additional prefix for Antarctica and South Shetland Islands.

It is available on Internet as ftp from ftp.cs.buffalo.edu (as pub/ham-radio/dxcc-k2di) and other Amateur Radio archive sites.

It is also available as E-mail from the ARRL Information Service - send a message containing the line "send dxcc-k2di" to info@arrl.org.

Ron McConnell's detailed geographical listing is also available via ftp from ftp.cs.buffalo.edu and from the same E-mail source as above including the lines "send dxcc-w2iol-inst", "send dxcc-w2iol-a-p" and "send dxcc-w2iol-q-z".

Our sincere thanks to Bill for his permission to publish this listing.

Please mail corrections and suggestions to Bill Brelsford, K2DI, AT&T, Basking Ridge NJ or wmb@joplin.att.com

| PRIMARY<br>PREFIX              | COUNTRY            | CONT | ITU<br>ZONE | CQ<br>ZONE | UTC<br>(+ or -) | LAT | LONG | OTHER<br>PREFIXES | PRIMARY<br>PREFIX | COUNTRY                | CONT   | ITU<br>ZONE | CQ<br>ZONE | UTC<br>(+ or -) | LAT | LONG | OTHER<br>PREFIXES |
|--------------------------------|--------------------|------|-------------|------------|-----------------|-----|------|-------------------|-------------------|------------------------|--------|-------------|------------|-----------------|-----|------|-------------------|
| ~ is for ITU unofficial prefix |                    |      |             |            |                 |     |      |                   | 5V                | Togo                   | Af     | 46          | 35         | +0              | 6N  | 1E   | 5V                |
| @ is for likely new countries  |                    |      |             |            |                 |     |      |                   | 5W                | Western Samoa          | Oc     | 62          | 32         | -11             | 14S | 172W | 5W                |
| * is for deleted countries     |                    |      |             |            |                 |     |      |                   | 5X                | Uganda                 | Af     | 48          | 37         | +3              | 0N  | 33E  | 5X                |
| 1A                             | SMO Malta          | Eu   | 28          | 15         | +1              | 42N | 13E  | 1A                | 5Z                | Kenya                  | Af     | 48          | 37         | +3              | 2S  | 37E  | 5Y-5Z             |
| 1M*                            | Minerva Reef       | Oc   | 62          | 32         | -12             | 24S | 179W | -                 | 6W                | Senegal                | Af     | 46          | 35         | +0              | 15N | 18W  | 6V-6W             |
| 1S                             | Sprattly Is        | As   | 50          | 26         | +7              | 9N  | 112E | 1S, 9M0           | 6Y                | Jamaica                | NA     | 11          | 00         | -5              | 18N | 77W  | 6Y                |
| 3A                             | Monaco             | Eu   | 27          | 14         | +1              | 44N | 8E   | 3A                | 7O                | Yemen                  | As     | 39          | 21         | +3              | 13N | 45E  | 7O                |
| 3B6                            | Agalega & St Br'on | Af   | 53          | 39         | +4              | 10S | 57E  | 3B7               | 7O*               | PDR Yemen              | As     | 39          | 21         | +3              | 13N | 45E  | -                 |
| 3B8                            | Mauritius          | Af   | 53          | 39         | +4              | 20S | 58E  | 3B                | 7P                | Lesotho                | Af     | 57          | 38         | +2              | 29S | 27E  | 7P                |
| 3B9                            | Rodriguez Is       | Af   | 53          | 39         | +4              | 20S | 63E  | -                 | 7Q                | Malawi                 | Af     | 53          | 37         | +2              | 14S | 34E  | 7Q                |
| 3C                             | Equatorial Guinea  | Af   | 47          | 36         | -1              | 4N  | 9E   | -                 | 7X                | Algeria                | Af     | 37          | 33         | +0              | 37N | 3E   | 7R, 7T-7Y         |
| 3C0                            | Pagalu             | Af   | 52          | 36         | -1              | 1S  | 6E   | -                 | 8P                | Barbados               | NA     | 11          | 00         | -4              | 13N | 60W  | 8P                |
| 3D2                            | Conway Reef        | Oc   | 56          | 32         | +12             | 22S | 175E | -                 | 8Q                | Maldives               | As, Af | 41          | 22         | +5              | 4N  | 73E  | 8Q                |
| 3D2                            | Fiji               | Oc   | 56          | 32         | +12             | 18S | 178E | 3DN-3DZ           | 8R                | Guyana                 | SA     | 12          | 09         | -3.75           | 6N  | 58W  | 8R                |
| 3D2                            | Rotuma             | Oc   | 56          | 32         | +12             | 13S | 177E | -                 | 8Z4*              | S Arabia/Iraq NZ       | As     | 39          | 21         | +3              | 29N | 46E  | -                 |
| 3DA                            | Swaziland          | AF   | 57          | 38         | +2              | 26S | 31E  | 3DA-3DM, 3D6      | 8Z5*              | Kuwait/S Arabia NZ     | As     | 39          | 21         | +3              | 29N | 48E  | 9K3               |
| 3V                             | Tunisia            | Af   | 37          | 33         | +1              | 37N | 10E  | 3V, TS            | 9A                | Croatia                | Eu     | 28          | 15         | +1              | 5N  | 16E  | 9A                |
| 3W                             | Vietnam            | As   | 49          | 26         | +7              | 11N | 107E | 3W, XV            | 9G                | Ghana                  | Af     | 46          | 35         | +0              | 5N  | 0W   | 9G                |
| 3X                             | Guinea             | Af   | 46          | 35         | +0              | 10N | 14W  | 3X                | 9H                | Malta                  | Eu     | 28          | 15         | +1              | 36N | 15E  | 9H                |
| 3Y                             | Bouvet             | Af   | 67          | 38         | +0              | 54S | 3E   | -                 | 9J                | Zambia                 | Af     | 53          | 36         | +2              | 15S | 28E  | 9I-9J             |
| 3Y                             | Peter I            | An   | 72          | 12         | -6              | 69S | 91W  | -                 | 9K                | Kuwait                 | As     | 39          | 21         | +3              | 29N | 48E  | 9K                |
| 4J                             | Azerbaijan         | As   | 29          | 21         | +4              | 40N | 50E  | 4J-4K UD          | 9L                | Sierra Leone           | Af     | 46          | 35         | +0              | 9N  | 13W  | 9L                |
| 4L                             | Georgia            | As   | 29          | 21         | +4              | 42N | 45E  | 4L UF             | 9M2               | Malaysia               | As     | 54          | 28         | +7.5            | 3N  | 102E | 9M, 9W, 9M4       |
| 4S                             | Sri Lanka          | As   | 41          | 22         | +5.5            | 7N  | 80E  | 4P-4S             | 9M6               | East Malaysia          | Oc     | 54          | 28         | +8              | 2N  | 110E | 9M8               |
| 4U                             | ITU Geneva         | Eu   | 28          | 14         | +1              | 46N | 6E   | -                 | 9N                | Nepal                  | As     | 42          | 22         | +5.75           | 28N | 85E  | 9N                |
| 4S                             | Sri Lanka          | As   | 41          | 22         | +5.5            | 7N  | 80E  | 4P-4S             | 9Q                | Zaire                  | Af     | 52          | 36         | +1              | 4S  | 15E  | 9O-9T             |
| 4U                             | ITU Geneva         | Eu   | 28          | 14         | +1              | 46N | 6E   | -                 | 9S4*              | Saar                   | Eu     | 08          | 14         | +1              | 49N | 7E   | -                 |
| 4U                             | UN HQ              | NA   | 08          | 05         | -5              | 41N | 74W  | 4U                | 9U                | Burundi                | Af     | 52          | 36         | +3              | 3S  | 29E  | 9U                |
| 4W*                            | Yemen Arab Rep     | As   | 39          | 21         | +3              | 15N | 44E  | -                 | 9U5*              | Rwanda-Urundi          | Af     | 52          | 36         | +3              | 3S  | 30E  | -                 |
| 4X                             | Israel             | As   | 39          | 20         | +2              | 32N | 35E  | 4X, 4Z            | 9V                | Singapore              | As     | 54          | 28         | +7.5            | 1N  | 104E | 9V, 56            |
| 5A                             | Libya              | Af   | 38          | 34         | +2              | 33N | 13E  | 5A                | 9X                | Rwanda                 | Af     | 52          | 36         | +3              | 2S  | 30E  | -                 |
| 5B                             | Cyprus             | As   | 39          | 20         | +3              | 35N | 33E  | 5B, C4, H2, P3    | 9Y                | Trinidad & Tobago      | SA     | 11          | 09         | -4              | 11N | 62W  | 9Y-9Z             |
| 5H                             | Tanzania           | Af   | 53          | 37         | +3              | 7S  | 39E  | 5H-5I             | A1*               | Abu Ail, Jabal at Tair | As     | 39          | 21         | +2              | 14N | 43E  | J2/A              |
| 5N                             | Nigeria            | Af   | 46          | 35         | +1              | 6N  | 3E   | 5N-5O             | A2                | Botswana               | Af     | 57          | 38         | +2              | 25S | 26E  | 80, A2            |
| 5R                             | Madagascar         | Af   | 53          | 39         | +3              | 19S | 48E  | 5R-5S, 6X         | A3                | Tonga                  | Oc     | 62          | 32         | +13             | 21S | 175W | A3                |
| 5T                             | Mauritania         | Af   | 46          | 35         | -1              | 18N | 16W  | 5T                | A4                | Oman                   | As     | 39          | 21         | +4              | 24N | 59E  | A4                |
| 5U                             | Niger              | Af   | 46          | 35         | +1              | 14N | 2W   | 5U                | A5                | Bhutan                 | As     | 41          | 22         | +5.5            | 27N | 90E  | A5                |



# DXCC COUNTRY LIST

| PRIMARY<br>PREFIX | COUNTRY            | CONT        | ITU<br>ZONE | CQ<br>ZONE | UTC<br>(+ or -) | LAT  | LONG           | OTHER<br>PREFIXES   | PRIMARY<br>PREFIX | COUNTRY              | CONT | ITU<br>ZONE | CQ<br>ZONE | UTC<br>(+ or -) | LAT  | LONG                          | OTHER<br>PREFIXES     |
|-------------------|--------------------|-------------|-------------|------------|-----------------|------|----------------|---------------------|-------------------|----------------------|------|-------------|------------|-----------------|------|-------------------------------|-----------------------|
| A6                | United Arab Emir's | As          | 39          | 21         | +4              | 24N  | 54E            | A6                  | F                 | France               | Eu   | 27          | 14         | +1              | 49N  | 2E                            | FA-FZ,HW-HY,          |
| A7                | Qatar              | As          | 39          | 21         | +4              | 25N  | 52E            | A7                  |                   |                      |      |             |            |                 |      |                               | TH,TK,TM,TO-TQ,TV-TX  |
| A9                | Bahrain            | As          | 39          | 21         | +4              | 26N  | 51E            | A9                  | FF*               | French W Africa      | Af   | 46          | 35         | +0              | 15N  | 18W                           |                       |
| AC3*              | Sikkim             | As          | 41          | 22         | +5.5            | 27N  | 89E            | -                   | FG                | Guadeloupe           | NA   | 11          | 08         | -4              | 16N  | 62W                           |                       |
| AC4*              | Tibet              | As          | 41          | 23         | +6              | 30N  | 92E            | -                   | FH                | Mayotte              | Af   | 53          | 39         | +3              | 13S  | 45E                           |                       |
| AP                | Pakistan           | As          | 41          | 21         | +5              | 34N  | 73E            | 6P-6S,AP-AS         | FH*               | Comoros              | Af   | 53          | 39         | +3              | 12S  | 43E                           | FB8                   |
| BV                | Taiwan             | As          | 44          | 24         | +8              | 25N  | 122E           | -                   | FI8*              | Fr Indo China        | As   | 49          | 26         | +7              | 11N  | 107E                          |                       |
| BY                | China              | As 33,42-44 | 23,24       | +8         | 40N             | 116E | 3H-3U,BA-BZ,XS | FK                  | New Caledonia     | Oc                   | 56   | 32          | +11        | 22S             | 167E |                               |                       |
| C2                | Nauru              | Oc          | 65          | 31         | +11.5           | 0S   | 167E           | C2                  | FM                | Martinique           | NA   | 11          | 08         | -4              | 15N  | 61W                           |                       |
| C3                | Andorra            | Eu          | 27          | 14         | +1              | 43N  | 2E             | C3                  | FN8*              | French India         | As   | 41          | 22         | +5.5            | 12N  | 80E                           |                       |
| C5                | Gambia             | Af          | 46          | 35         | +0              | 13N  | 17W            | C5                  | FO                | French Polynesia     | Oc   | 63          | 32         | -10             | 18S  | 150W                          |                       |
| C6                | Bahamas            | NA          | 11          | 08         | -5              | 25N  | 77W            | C6                  | FO0               | Clipperton Is        | NA   | 10          | 07         | -7              | 10N  | 109W                          |                       |
| C9                | Mozambique         | Af          | 53          | 37         | +2              | 26S  | 33E            | C8-C9               | FP                | St Pierre & Miq'n    | NA   | 09          | 05         | -4              | 47N  | 56W                           |                       |
| C9*               | Manchuria          | As          | 33          | 24         | +8.5            | 46N  | 127E           | -                   | FQ8*              | Fr Equatorial Africa | Af   | 47,52       | 36         | +1              | 5N   | 18E                           |                       |
| CE                | Chile              | SA          | 14,16       | 12         | -4              | 33S  | 71W            | 3G,CA-CE,XQ-XR      | FR                | Glorioso Is          | Af   | 53          | 39         | +3              | 12S  | 47E                           |                       |
| CE0 X             | San Felix          | SA          | 14          | 12         | -5              | 26S  | 80W            | -                   | FR                | Juan de Nova, E'pa   | Af   | 53          | 39         | +3              | 17N  | 43E                           |                       |
| CE0 Y             | Easter Is          | SA          | 63          | 12         | -7              | 27S  | 109W           | -                   | FR                | Reunion              | Af   | 53          | 39         | +4              | 21S  | 55E                           |                       |
| CE0 Z             | Juan Fernandez     | SA          | 14          | 12         | -4              | 34S  | 79W            | -                   | FR                | Tromelin             | Af   | 53          | 39         | +4              | 16S  | 54E                           |                       |
| CE9               | Antarctica         | An          | VARIOUS     | +0         | 90S             | 0W   | VARIOUS        | FS                  | St Martin         | NA                   | 11   | 08          | -4         | 18N             | 63W  | FJ                            |                       |
| CN                | Morocco            | Af          | 37          | 33         | +0              | 34N  | 7W             | 5C-5G,CN            | FT_W              | Crozet               | Af   | 68          | 39         | +3              | 46S  | 52E                           |                       |
| CN2*              | Tangier            | Af          | 37          | 33         | +0              | 36N  | 8W             |                     | FT_X              | Kerguelen Is         | Af   | 68          | 39         | +5              | 50S  | 70E                           |                       |
| CO                | Cuba               | NA          | 11          | 08         | -5              | 23N  | 82W            | CL-CM,CO,T4         | FT_Z              | A'dam & St Paul Is   | Af   | 68          | 39         | +5              | 38S  | 78E                           |                       |
| CP                | Bolivia            | SA          | 12,14       | 10         | -4              | 17S  | 68W            | CP                  | FW                | Wallis & Futuna Is   | Oc   | 62          | 32         | -10.5           | 14S  | 172W                          |                       |
| CR8*              | Damao, Diu         | As          | 41          | 22         | +5.5            | 21N  | 71E            |                     | FY                | French Guiana        | SA   | 12          | 09         | -4              | 5N   | 52W                           |                       |
| CR8*              | Goa                | As          | 41          | 22         | +5.5            | 16N  | 74E            |                     | G                 | England              | Eu   | 27          | 14         | +0              | 52N  | 0W                            | 2A-2Z,GA-GZ,          |
| CR8*              | Portuguese Timor   | Oc          | 54          | 28         | +8              | 9S   | 126E           |                     |                   |                      |      |             |            |                 |      | MA-MZ,VP-VS,ZB-ZJ,ZN-ZO,ZQ,2E |                       |
| CT                | Portugal           | Eu          | 37          | 14         | +1              | 39N  | 9W             | CQ-CU,XX            | GD                | Isle of Man          | Eu   | 27          | 14         | +0              | 54N  | 4W                            | 2D                    |
| CT3               | Madeira Is         | Af          | 36          | 33         | -1              | 33N  | 17W            |                     | GI                | Nth Ireland          | Eu   | 27          | 14         | +0              | 55N  | 6W                            | 2I                    |
| CU                | Azores             | Eu          | 36          | 14         | -1              | 38N  | 26W            | CT2                 | GJ                | Jersey               | Eu   | 27          | 14         | +0              | 49N  | 2W                            | 2J                    |
| CX                | Uruguay            | SA          | 14          | 13         | -3              | 35S  | 56W            | CV-CX               | GM                | Scotland             | Eu   | 27          | 14         | +0              | 57N  | 2W                            | 2M                    |
| CY0               | Sable Is           | NA          | 09          | 05         | -5              | 44N  | 60W            |                     | GU                | Guernsey             | Eu   | 27          | 14         | +0              | 49N  | 3W                            | 2U                    |
| CY9               | St Paul Is         | NA          | 09          | 05         | -5              | 47N  | 60W            |                     | GW                | Wales                | Eu   | 27          | 14         | +0              | 52N  | 3W                            | 2W                    |
| D2                | Angola             | Af          | 52          | 36         | +1              | 9S   | 13E            | D2-D3               | H4                | Solomon Is           | Oc   | 51          | 28         | +11             | 9S   | 160E                          | H4                    |
| D4                | Cape Verde         | Af          | 46          | 35         | -2              | 15N  | 23W            | D4                  | HA                | Hungary              | Eu   | 28          | 15         | +1              | 48N  | 19E                           | HA,HG                 |
| D6                | Comoros            | Af          | 53          | 39         | +3              | 12S  | 43E            | D6                  | HB                | Switzerland          | Eu   | 28          | 14         | +1              | 47N  | 7E                            | HB,HE                 |
| DL                | Germany            | Eu          | 28          | 14         | +1              | 52N  | 7E             | DA-DR,Y2-Y9         | HB0               | Liechtenstein        | Eu   | 28          | 14         | +1              | 47N  | 10E                           |                       |
| DL*               | Germany            | Eu          | 28          | 14         | +1              | 52N  | 7E             |                     | HC                | Ecuador              | SA   | 12          | 10         | -5              | 0N   | 79W                           | HC-HD                 |
| DU                | Philippines        | Oc          | 50          | 27         | +8              | 15N  | 121E           | 4D-4I,DU-DZ         | HC8               | Galapagos Is         | SA   | 12          | 10         | -5              | 1S   | 90W                           |                       |
| E3                | Eritrea            | Af          | 48          | 37         | +3              | 15N  | 39E            | E3 ET2              | HH                | Haiti                | NA   | 11          | 08         | -5              | 19N  | 72W                           | 4V,HH                 |
| EA                | Spain              | Eu          | 37          | 14         | +1              | 40N  | 4W             | AM-AO,EA-EH         | HI                | Dominican Rep        | NA   | 11          | 08         | -5              | 18N  | 70W                           | HI                    |
| EA6               | Balearic Is        | Eu          | 37          | 14         | +1              | 38N  | 3E             |                     | HK                | Colombia             | SA   | 12          | 09         | -5              | 5N   | 74W                           | 5J-5K, HJ-HK          |
| EA8               | Canary Is          | Af          | 36          | 33         | +0              | 28N  | 15W            |                     | HK0               | Malpelo Is           | SA   | 12          | 09         | -5              | 4N   | 82W                           |                       |
| EA9               | Ceuta & Melilla    | Af          | 37          | 33         | +1              | 36N  | 5W             |                     | HK0               | San And's & Pr'cia   | NA   | 11          | 07         | -6              | 13N  | 82W                           |                       |
| EA9*              | Ifni               | Af          | 37          | 33         | +0              | 29N  | 10W            |                     | HK0 *             | Bajo Nuevo           | NA   | 11          | 08         | -5              | 16N  | 79W                           |                       |
| EI                | Ireland            | Eu          | 27          | 14         | +0              | 53N  | 6W             | EI-EJ               | HK0 *             | Ser'na Bnk,Ro'r Cay  | NA   | 11          | 07         | -5              | 14N  | 80W                           | KP3,KS4               |
| EK                | Armenia            | As          | 29          | 21         | +4              | 40N  | 45E            | EK UG               | HL                | Sth Korea            | As   | 44          | 25         | +9              | 38N  | 127E                          | 6K-6N, DS-DT,         |
| EL                | Liberia            | Af          | 46          | 35         | -0.75           | 6N   | 11W            | 5L 5M, 6Z,A8, D5,EL |                   |                      |      |             |            |                 |      | D7-D9,HL                      |                       |
| EP                | Iran               | As          | 40          | 21         | +3.5            | 36N  | 51E            | 9B-9D, EP-EQ        | HP                | Panama               | NA   | 11          | 07         | -5              | 9N   | 80W                           | 3E-3F,HO-HP, H3,H8-H9 |
| ER                | Moldova            | Eu          | 29          | 16         | +3              | 47N  | 29E            | ER UO               | HR                | Honduras             | NA   | 11          | 07         | -6              | 14N  | 87W                           | HQ-HR                 |
| ES                | Estonia            | Eu          | 29          | 15         | +2              | 59N  | 25E            | ES UR               | HS                | Thailand             | As   | 49          | 26         | +6              | 14N  | 101E                          | E2,HS                 |
| ET                | Ethiopia           | Af          | 48          | 37         | +3              | 9N   | 39E            | 9E-9F,ET            | HV                | Vatican              | Eu   | 28          | 15         | +1              | 42N  | 13E                           | HV                    |
| EV                | Belarus            | Eu          | 29          | 16         | +2              | 54N  | 28E            | EU-EW UC            | HZ                | Saudi Arabia         | As   | 39          | 21         | +3              | 25N  | 47E                           | 8Z,HZ,7Z              |
| EX                | Kyrgyzstan         | As          | 30-31       | 17         | +6              | 43N  | 75E            | EX UM               | I                 | Italy                | Eu   | 28          | 15         | +1              | 42N  | 12E                           | IA-IZ                 |
| EY                | Tajikistan         | As          | 30          | 17         | +6              | 39N  | 69E            | EY UJ               | I1*               | Trieste              | Eu   | 28          | 15         | +1              | 46N  | 14E                           |                       |
| EZ                | Turkmenistan       | As          | 30          | 17         | +5              | 38N  | 58E            | EZ UH               | I5*               | Ital Somaliland      | Af   | 48          | 37         | +3              | 2N   | 46E                           |                       |



| PRIMARY<br>PREFIX | COUNTRY            | CONT | ITU<br>ZONE | CQ<br>ZONE | UTC<br>(+ or -) | LAT | LONG | OTHER<br>PREFIXES            | PRIMARY<br>PREFIX | COUNTRY               | CONT   | ITU<br>ZONE | CQ<br>ZONE | UTC<br>(+ or -) | LAT | LONG | OTHER<br>PREFIXES |
|-------------------|--------------------|------|-------------|------------|-----------------|-----|------|------------------------------|-------------------|-----------------------|--------|-------------|------------|-----------------|-----|------|-------------------|
| IS                | Sardinia           | Eu   | 28          | 15         | +1              | 39N | 9E   |                              | OX                | Greenland             | NA     | 05,75       | 40         | -3              | 64N | 52W  | XP                |
| J2                | Djibouti           | Af   | 48          | 37         | +3              | 12N | 43E  | J2                           | OY                | Faroe Is              | Eu     | 18          | 14         | +0              | 62N | 7W   | -                 |
| J3                | Grenada            | NA   | 11          | 08         | -4              | 12N | 62W  | J3                           | OZ                | Denmark               | Eu     | 18          | 14         | +1              | 56N | 13E  | 5P-5Q OU-         |
| J5                | Guinea-Bissau      | Af   | 46          | 35         | -1              | 12N | 16W  | J5                           |                   |                       |        |             |            |                 |     |      | OZ,XP             |
| J6                | St Lucia           | NA   | 11          | 08         | -4              | 14N | 61W  | J6                           | P2                | Papua New Guinea      | Oc     | 51          | 28         | +10             | 10S | 147E | P2                |
| J7                | Dominica           | NA   | 11          | 08         | -4              | 15N | 61W  | J7                           | P2*               | Papua Terr            | Oc     | 51          | 28         | +10             | 10S | 147E | VK9               |
| J8                | St Vincent         | NA   | 11          | 08         | -4              | 13N | 61W  | J8                           | P2*               | Terr New Guinea       | Oc     | 51          | 28         | +10             | 10S | 147E | VK9               |
| JA                | Japan              | As   | 45          | 25         | +9              | 36N | 140E | 7J-7N,8J-8N,<br>JA-JS        | P4                | Aruba                 | SA     | 11          | 09         | -4              | 13N | 70W  | P4                |
| JD                | Minami Torishima   | Oc   | 45/90       | 27         | +10             | 24N | 154E |                              | P5                | Nth Korea             | As     | 44          | 25         | +9              | 39N | 126E | HM,P5-P9          |
| JD                | Ogasawara          | As   | 45          | 27         | +10             | 28N | 142E |                              | PA                | Netherlands           | Eu     | 27          | 14         | +1              | 52N | 5E   | PA-PI             |
| JD1*              | Okino Tori-shima   | As   | 45          | 27         | +10             | 30N | 140E | J1                           | PJ2               | Neth Antilles         | SA     | 11          | 09         | -4              | 12N | 69W  | PJ,PJ4,PJ9        |
| JT                | Mongolia           | As   | 32,33       | 23         | +7.5            | 48N | 107E | JT-JV                        | PJ5               | St M'ten,Saba,St Eus  | NA     | 11          | 08         | -4              | 18N | 63W  | PJ6-8             |
| JW                | Svalbard           | Eu   | 18          | 40         | +1              | 78N | 16E  |                              | PK1*              | Java                  | Oc     | 54          | 28         | +7.5            | 6S  | 107E | PK2-3             |
| JX                | Jan Mayen          | Eu   | 18          | 40         | -1              | 71N | 9W   |                              | PK4*              | Sumatra               | Oc     | 54          | 28         | +7              | 1S  | 100E | -                 |
| JY                | Jordan             | As   | 39          | 20         | +2              | 32N | 36E  | JY                           | PK5*              | N'ands Borneo         | Oc     | 54          | 28         | +8              | 3S  | 115E | -                 |
| JZ0*              | Neth New Guinea    | Oc   | 51          | 28         | +10             | 10S | 147E |                              | PK6*              | Celebe & Molucca Is   | Oc     | 54          | 28         | +8              | 5S  | 119E | -                 |
| K                 | United States      | NA   | 06-08       | 03-05      | -5              | 39N | 77W  | AA-AL, KA-KZ,<br>NA-NZ,WA-WZ | PY                | Brazil                | SA     | 12,13,15    | 11         | -3              | 16S | 48W  | PP-PY,ZV-ZZ       |
| KC6               | Belau              | Oc   | 64          | 27         | +10             | 7N  | 134E |                              | PY0F              | Fernando de N'nha     | SA     | 13          | 11         | -2              | 4S  | 32W  | -                 |
| KG4               | Guantanamo Bay     | NA   | 11          | 08         | -5              | 20N | 75W  |                              | PY0P              | St P'r & St P' Rocks  | SA     | 13          | 11         | -2              | 0N  | 29W  | -                 |
| KH0               | Mariana Is         | Oc   | 64          | 27         | +10             | 15N | 146E |                              | PY0T              | Tri'de & M'tin Vaz Is | SA     | 15          | 11         | -2              | 21S | 29W  | -                 |
| KH1               | Baker & Howland Is | Oc   | 61          | 31         | -12             | 0N  | 176W |                              | PZ                | Surinam               | SA     | 12          | 09         | -3.5            | 6N  | 55W  | PZ                |
| KH2               | Guam               | Oc   | 64          | 27         | +10             | 13N | 145E |                              | R1FJ              | Franz Josef Land      | Eu     | 75          | 40         | +3              | 81N | 48E  | 4K2               |
| KH3               | Johnston Is        | Oc   | 61          | 31         | -11             | 17N | 170W |                              | R1MV              | Mal'y Vysotskij Is    | Eu     | 29          | 16         | +3              | 61N | 29E  | 4J1               |
| KH4               | Midway Is          | Oc   | 61          | 31         | -11             | 28N | 177W |                              | S0                | Western Sahara        | Af     | 37          | 33         | +0              | 27N | 13W  | S0                |
| KH5               | Palmyra, Jarvis Is | Oc   | 61,62       | 31         | -11             | 6N  | 162W |                              | S2                | Bangladesh            | As     | 41          | 22         | +6              | 24N | 90E  | S2-S3             |
| KH5K              | Kingman Reef       | Oc   | 61          | 31         | -11             | 6N  | 162W |                              | S5                | Slovenia              | Eu     | 28          | 15         | +1              | 46N | 14E  | S5                |
| KH6               | Hawaii             | Oc   | 61          | 31         | -10             | 21N | 158W |                              | S7                | Seychelles            | Af     | 53          | 39         | +4              | 5S  | 55E  | S7                |
| KH7               | Kure Is            | Oc   | 61          | 31         | -11             | 29N | 178W |                              | S9                | Sao Tome & Principe   | Af     | 47          | 36         | +0              | 0N  | 7E   | S9                |
| KH8               | Am Samoa           | Oc   | 62          | 32         | -11             | 14S | 171W |                              | SM                | Sweden                | Eu     | 18          | 14         | +1              | 59N | 18E  | 7S,8S, SA-SM      |
| KH9               | Wake Is            | Oc   | 65          | 31         | +12             | 19N | 167E |                              | SP                | Poland                | Eu     | 28          | 15         | +1              | 52N | 21E  | 3Z,HF, SN-SR      |
| KL7               | Alaska             | NA   | 01,02       | 01         | -8              | 58N | 134W |                              | ST                | Sudan                 | Af     | 48          | 34         | +2              | 16N | 33E  | 6T-6U,SSN-SSZ,ST  |
| KP1               | Navassa Is         | NA   | 11          | 08         | -5              | 18N | 75W  |                              | ST0               | Southern Sudan        | Af     | 48          | 34         | +2              | 5N  | 32E  | -                 |
| KP2               | Virgin Is          | NA   | 11          | 08         | -4              | 18N | 65W  |                              | SV                | Egypt                 | Af,As  | 38          | 34         | +2              | 31N | 31E  | 6A-6B SSA-SSM,SU  |
| KP4               | Puerto Rico        | NA   | 11          | 08         | -4              | 18N | 66W  |                              | SV5               | Greece                | Eu     | 28          | 20         | +2              | 38N | 24E  | J4,SV-SZ          |
| KP5               | Desecheo Is        | NA   | 11          | 08         | -4              | 18N | 68W  |                              | SV9               | Dodecanese            | Eu     | 28          | 20         | +2              | 36N | 28E  | -                 |
| KR6*              | Okinawa (Ryukyu)   | As   | 45          | 25         | +8              | 26N | 128E | KR8, JR6, KA6                | SY                | Mt Athos              | Eu     | 28          | 20         | +2              | 40N | 24E  | SV1/A             |
| KS4*              | Swan Is            | NA   | 11          | 07         | -6              | 17N | 84W  |                              | T2                | Tuvalu                | Oc     | 65          | 31         | +12             | 9S  | 179E | T2                |
| KZ5*              | Canal Zone         | NA   | 11          | 07         | -5              | 9N  | 80W  |                              | T30               | West Kiribati         | Oc     | 65          | 31         | +12             | 1S  | 173E | -                 |
| LA                | Norway             | Eu   | 18          | 14         | +1              | 60N | 11E  | 3Y, W-JX, LA-LN              | T31               | Central Kiribati      | Oc     | 62          | 31         | +12             | 4S  | 171W | T3                |
| LU                | Argentina          | SA   | 14,16       | 13         | -3              | 35S | 58W  | AY-AZ, LO-LW,<br>L2-L9       | T32               | East Kiribati         | Oc     | 61,63       | 31         | +12             | 2N  | 158W | -                 |
| LX                | Luxembourg         | Eu   | 27          | 14         | +1              | 50N | 6E   | LX                           | T33               | Banaba                | Oc     | 65          | 31         | +11.5           | 1S  | 170E | -                 |
| LY                | Lithuania          | Eu   | 29          | 15         | +2              | 55N | 25E  | LY UP                        | T5                | Somalia               | Af     | 48          | 37         | +3              | 2N  | 46E  | 60,T5             |
| LZ                | Bulgaria           | Eu   | 28          | 20         | +2              | 43N | 23E  | LZ                           | T7                | San Marino            | Eu     | 28          | 15         | +1              | 44N | 12E  | T7                |
| OA                | Peru               | SA   | 12          | 10         | -5              | 12S | 78W  | 4T,OA-OC                     | T9                | Bosnia-Herzegovina    | Eu     | 28          | 15         | +1              | 44N | 18E  | T9 4N4            |
| OD                | Lebanon            | As   | 39          | 20         | +2              | 34N | 36E  | OD                           | TA                | Turkey                | As, Eu | 39          | 20         | +2              | 40N | 33E  | TA-TC, YM         |
| OE                | Austria            | Eu   | 28          | 15         | +1              | 48N | 16E  | OE                           | TF                | Iceland               | Eu     | 17          | 40         | +0              | 64N | 22W  | TF                |
| OH                | Finland            | Eu   | 18          | 15         | +2              | 60N | 25E  | OF-OJ                        | TG                | Guatemala             | NA     | 11          | 07         | -6              | 16N | 92W  | TD,TG             |
| OH0               | Aland Is           | Eu   | 18          | 15         | +2              | 60N | 20E  | -                            | TI                | Costa Rica            | NA     | 11          | 07         | -6              | 10N | 84W  | TE,TI             |
| OJ0               | Market Reef        | Eu   | 18          | 15         | +2              | 60N | 19E  | -                            | TI9               | Cocos Is              | NA     | 11          | 07         | -6              | 6N  | 87W  | -                 |
| OK                | Czech Republic     | Eu   | 28          | 15         | +1              | 50N | 16E  | OK-OL                        | TJ                | Cameroon              | Af     | 47          | 36         | +1              | 4N  | 12E  | TJ                |
| OK*               | Czechoslovakia     | Eu   | 28          | 15         | +1              | 50N | 15E  | -                            | TK                | Corsica               | Eu     | 28          | 15         | +1              | 42N | 9E   | -                 |
| OM                | Slovakia           | Eu   | 28          | 15         | +1              | 49N | 20E  | OM                           | TL                | Central African Rep   | Af     | 47          | 36         | +1              | 5N  | 19E  | TL                |
| ON                | Belgium            | Eu   | 27          | 14         | +1              | 51N | 4E   | ON-OT                        | TN                | Congo                 | Af     | 52          | 36         | +1              | 4S  | 15E  | TN                |
|                   |                    |      |             |            |                 |     |      |                              | TR                | Gabon                 | Af     | 52          | 36         | +1              | 1N  | 10E  | TR                |
|                   |                    |      |             |            |                 |     |      |                              | TT                | Chad                  | Af     | 47          | 36         | +1              | 12N | 15E  | TT                |



# DXCC COUNTRY LIST

| PRIMARY<br>PREFIX | COUNTRY            | CONT | ITU<br>ZONE    | CQ<br>ZONE | UTC<br>(+ or -) | LAT | LONG | OTHER<br>PREFIXES                            | PRIMARY<br>PREFIX | COUNTRY              | CONT | ITU<br>ZONE | CQ<br>ZONE | UTC<br>(+ or -) | LAT | LONG | OTHER<br>PREFIXES              |
|-------------------|--------------------|------|----------------|------------|-----------------|-----|------|--|-------------------|----------------------|------|-------------|------------|-----------------|-----|------|--------------------------------|
| TU                | Ivory Coast        | Af   | 46             | 35         | +0              | 5N  | 4W   | TU   | VS9H*             | Kuria Muria Is       | As   | 39          | 21         | +4              | 18N | 56E  |                                |
| TY                | Benin              | Af   | 46             | 35         | +0              | 6N  | 3E   | TY   | VS9K*             | Kamaron Is           | As   | 39          | 21         | +3              | 15N | 43E  | 70                             |
| TZ                | Mali               | Af   | 46             | 35         | +0              | 13N | 8W   | TZ   | VU                | India                | As   | 41          | 22         | +5.5            | 29N | 77E  | 8T-8Y,<br>AT-AW,VT-VW          |
| UA                | Russia             | Eu   | 19,20,29,30    |            |                 |     |      |  | VU7               | Andaman & Nicobar Is | As   | 49          | 26         | +5.5            | 12N | 93E  |                                |
|                   |                    |      | 16             | +3         |                 | 56N | 37E  | RA-RZ, UA-UI                                 | VU7               | Laccadive Is         | As   | 41          | 22         | +5.5            | 11N | 73E  |                                |
| UA2               | Kaliningrad        | Eu   | 29             | 15         | +2              | 55N | 21E  |  | XE                | Mexico               | NA   | 10          | 06         | -6              | 20N | 99W  | 4A-4C,6D-6J,XA-XI              |
| UA9               | Russia (Asiatic)   | As   | 20-26,30-35,75 |            |                 |     |      |  | XF4               | Revilla Gigedo       | NA   | 10          | 06         | -7              | 18N | 113W |                                |
|                   |                    |      | 16-19,23       | +7         |                 | 52N | 10   | 4E UA0                                       | XT                | Burkina Faso         | Af   | 46          | 35         | +0              | 12N | 2W   | XT                             |
| UK                | Uzbekistan         | As   | 30             | 17         | +6              | 41N | 69E  | UJ-UM UI                                     | XU                | Cambodia             | As   | 49          | 26         | +8              | 12N | 105E | XU                             |
| UN                | Kazakhstan         | As   | 29-31          | 17         | +5.5            | 43N | 77E  | UN-UQ,UL                                     | XW                | Laos                 | As   | 49          | 26         | +7              | 20N | 102E | XW                             |
| UN1*              | Karelo-Finnish Rep | Eu   | 19             | 16         | +3              | 64N | 32E  |  | XX9               | Macao                | As   | 44          | 24         | +8              | 22N | 114E |                                |
| UR                | Ukraine            | Eu   | 29             | 16         | +2              | 50N | 30E  | EM-EQ,UR-UZ,UB                               | XZ                | Myanmar (Burma)      | As   | 49          | 26         | +6.5            | 17N | 96E  | XY-XZ                          |
| V2                | Antigua, Barbuda   | NA   | 11             | 08         | -4              | 17N | 62W  | V2   | Y2*               | East Germany         | Eu   | 28          | 14         | +1              | 53N | 13E  | Y3-Y9                          |
| V3                | Belize             | NA   | 11             | 07         | -5.5            | 17N | 89W  | V3   | YA                | Afghanistan          | As   | 40          | 21         | +4.5            | 35N | 69E  | T6,YA                          |
| V4                | St Kitts, Nevis    | NA   | 11             | 08         | -4              | 17N | 63W  | V4   | YB                | Indonesia            | Oc   | 51,54       | 28         | +7.5            | 6S  | 107E | 7A-7I,8A-8I,JZ,<br>PK-PO,YB-YH |
| V5                | Namibia            | Af   | 57             | 38         | +2              | 22S | 17E  | V5   | YI                | Iraq                 | As   | 39          | 21         | +3              | 32N | 45E  | HN,YI                          |
| V6                | Micronesia         | Oc   | 65             | 27         | +11             | 7N  | 158E | V6 KC6                                       | YJ                | Vanuatu              | Oc   | 56          | 32         | +11             | 18S | 168E | YJ                             |
| V7                | Marshall Is        | Oc   | 65             | 31         | +12             | 7N  | 171E | V7 KX6                                       | YK                | Syria                | As   | 39          | 20         | +2              | 34N | 36E  | 6C,YK                          |
| V8                | Brunei             | Oc   | 54             | 28         | +8              | 5N  | 115E | V8   | YL                | Latvia               | Eu   | 29          | 15         | +2              | 57N | 24E  | YL UQ                          |
| VE                | Canada             | NA   | 02-04,09,75    |            |                 |     |      |  | YN                | Nicaragua            | NA   | 11          | 07         | -6              | 12N | 87W  | HT,<br>H6-H7,YN                |
|                   |                    |      | 01-05          | -5         |                 | 45N | 76W  | CF-CK,CY-<br>CZ,VA-<br>VG,VO,VX-<br>VY,XJ-XO | Y0                | Romania              | Eu   | 28          | 20         | +2              | 45N | 26E  | YO-YR                          |
| VK                | Australia          | Oc   | 55,58,59       |            |                 |     |      |  | YS                | El Salvador          | NA   | 11          | 07         | -6              | 14N | 89W  | HU,YS                          |
|                   |                    |      | 29,30          | +10        |                 | 35S | 149E | AX,VH-VN,VZ                                  | YU                | Yugoslavia           | Eu   | 28          | 15         | +1              | 45N | 20E  | 4N-4O,<br>YT-YU,YZ             |
| VK0               | Heard Is           | Af   | 68             | 39         | +5              | 53S | 73E  |  | YV                | Venezuela            | SA   | 12          | 09         | -4              | 10N | 67W  | 4M,YV-YY                       |
| VK0               | Macquarie Is       | Oc   | 60             | 30         | +11             | 54S | 159E |  | YV0               | Aves Is              | NA   | 11          | 08         | -4              | 16N | 64W  |                                |
| VK9C              | Cocos-Keeling Is   | Oc   | 54             | 29         | +6.5            | 12S | 97E  | VK9Y   | Z2                | Zimbabwe             | Af   | 53          | 38         | +2              | 18S | 31E  | Z2                             |
| VK9L              | Lord Howe Is       | Oc   | 60             | 30         | +10             | 31S | 159E |  | Z3                | Macedonia            | Eu   | 28          | 15         | +1              | 42N | 21E  | Z3 4N5                         |
| VK9M              | Mellish Reef       | Oc   | 56             | 30         | +10             | 17S | 156E | VK9Z   | ZA                | Albania              | Eu   | 28          | 15         | +1              | 41N | 20E  | ZA                             |
| VK9N              | Norfolk Is         | Oc   | 60             | 32         | +11.5           | 29S | 168E |  | ZB                | Gibraltar            | As   | 39          | 20         | +2              | 36N | 33E  |                                |
| VK9W              | Willis Is          | Oc   | 55             | 30         | +10             | 16S | 150E | VK9Z   | ZC5*              | Br Nth Borneo        | Oc   | 54          | 28         | +8              | 6N  | 116E |                                |
| VK9X              | Christmas Is       | Oc   | 54             | 29         | +7              | 10S | 106E |  | ZC6*              | Palestine            | As   | 39          | 20         | +2              | 32N | 35E  | 4X1                            |
| VO*               | Newf'land, Lab'dor | NA   | 09             | 02-05      | -3.5            | 48N | 53W  |  | ZD4*              | Gold Coast, T'land   | Af   | 46          | 35         | +0              | 5N  | 0W   |                                |
| VP2E              | Anguilla           | NA   | 11             | 08         | -4              | 18N | 63W  |  | ZD7               | St Helena            | Af   | 66          | 36         | +0              | 16S | 6W   |                                |
| VP2M              | Montserrat         | NA   | 11             | 08         | -4              | 17N | 62W  |  | ZD8               | Ascension Is         | Af   | 66          | 36         | +0              | 8S  | 14W  |                                |
| VP2V              | Br Virgin Is       | NA   | 11             | 08         | -4              | 18N | 65W  |  | ZD9               | Tristan da Cunha     |      |             |            |                 |     |      |                                |
| VP5               | Turks & Caicos Is  | NA   | 11             | 08         | -5              | 22N | 72W  |  |                   | & Gough Is           | Af   | 66          | 38         | +0              | 37S | 12W  |                                |
| VP8               | Falkland Is        | SA   | 16             | 13         | -4              | 52S | 58W  |  | ZF                | Cayman Is            | NA   | 11          | 08         | -5              | 19N | 81W  |                                |
| VP8               | Sth Georgia Is     | SA   | 73             | 13         | -1.5            | 54S | 37W  | LU_Z   | ZK1               | Nth Cook Is          | Oc   | 62,63       | 32         | -10.5           | 10S | 161W |                                |
| VP8               | Sth Orkney Is      | SA   | 73             | 13         | -3              | 61S | 45W  | LU_Z   | ZK1               | Sth Cook Is          | Oc   | 63          | 32         | -10.5           | 22S | 158W |                                |
| VP8               | Sth Sandwich Is    | SA   | 73             | 13         | -3              | 59S | 27W  | LU_Z   | ZK2               | Niue                 | Oc   | 62          | 32         | -11             | 19S | 70W  |                                |
| VP8               | Sth Shetland Is    | SA   | 73             | 13         | -4              | 62S | 59W  | LU_Z,CE9, HF0,<br>RT1AN,4K1                  | ZK3               | Tokelau Is           | Oc   | 62          | 31         | -11             | 9S  | 171W |                                |
| VP9               | Bermuda            | NA   | 11             | 05         | -4              | 32N | 65W  |  | ZL                | New Zealand          | Oc   | 60          | 32         | +12             | 41S | 175E | ZK-ZM                          |
| VQ1*              | Zanzibar           | Af   | 53             | 37         | +3              | 7S  | 39E  | 5H1  | ZL7               | Chatham Is           | Oc   | 60          | 32         | +12.75          | 44S | 177W |                                |
| VQ6*              | British Somaliland | Af   | 48             | 37         | +3              | 2N  | 46E  |  | ZL8               | Kermadec Is          | Oc   | 60          | 32         | +12             | 29S | 178W |                                |
| VQ9               | Chagos             | Af   | 41             | 39         | +5              | 7S  | 72E  |  | ZL9               | Auckland, C'bell Is  | Oc   | 60          | 32         | +12             | 51S | 166E |                                |
| VQ9*              | Aldabra            | Af   | 53             | 39         | +4              | 9S  | 46E  |  | ZP                | Paraguay             | SA   | 14          | 11         | -4              | 26S | 57W  | ZP                             |
| VQ9*              | Desroches          | Af   | 53             | 39         | +4              | 6S  | 55E  |  | ZS                | Sth Africa           | Af   | 57          | 38         | +2              | 26S | 28E  | H5,S4,S8,V9,ZR-ZU              |
| VQ9*              | Farquhar           | Af   | 53             | 39         | +4              | 10S | 51E  |  | ZS0*              | Penguin Is           | Af   | 57          | 38         | +2              | 27S | 15E  |                                |
| VR2               | Hong Kong          | As   | 44             | 24         | +8              | 22N | 114E | VS6  | ZS8               | Pr Ed'd & Mar'n Is   | Af   | 57          | 38         | +3              | 47S | 38E  |                                |
| VR6               | Pitcairn Is        | Oc   | 63             | 32         | -8.5            | 25S | 130W |  | ZS9*              | Walvis Bay           | Af   | 57          | 38         | +2              | 23S | 15E  |                                |
| VS2*              | Malaya             | As   | 54             | 28         | +7.5            | 3N  | 102E | 9M2  | ~~~*              | Blenheim Reef        | Af   | 41          | 39         | +5              | 7S  | 72E  |                                |
| VS4*              | Sarawak            | Oc   | 54             | 28         | +8              | 2N  | 110E |  | ~~~*              | Geyser Reef          | Af   | 53          | 39         | +3              | 12S | 46E  |                                |



# MODIFICATIONS FOR THE MFJ1270/1274 TNC2 AND CLONES

By Greg Towells

Judging by the amount of mail and inquiries I receive about packet radio and general monitoring of digital signals, interest in that area of communications is really taking off.

Many former shortwave listeners and scanner fanatics are hooking their desktop PCs into their radios and discovering a whole new world of communications happening that they scarcely knew existed before.

A lot of the questions I receive from readers relate to the setting up of TNCs (terminal node controllers) to their radios and computers.

Many TNCs for packet use allow adjustment by the user to set mark and space tones for transmission and the center tone for reception.

If you have set up your packet TNC on an active frequency and are having trouble receiving many packets, or having problems with connects to other stations, it is possible that these tones are not adjusted properly. This could be the case especially if you obtained the unit second-hand.

The following procedure is for the popular MFJ 1270/1274 TNC2-type TNC and clones.

The instruction manual for these units clearly illustrates the procedure for 300 baud packet, commonly used on HF, but says little for the more common 1200 baud, used on VHF and UHF frequencies. As part of its built-in software, the TNC2-type TNCs have two calibration commands.

Three tones are involved:  
1200 Hz Mark tone (low tone)  
2200 Hz Space tone (high tone)  
1685 Hz Center tone (demodulator)

The manual states that 1700 Hz is ideal for the demodulator or center tone, however experimentation shows 1685 Hz to be just that bit better.

If you are having problems with a lot of retries and connects, it could be that your TNC is not generating compatible mark and space tones.

To calibrate the 1200 baud tones of your TNC, carry out the following:

- Remove the cover of your TNC, making sure that the HF/VHF button is in the VHF position.
- Find a small enough screwdriver to adjust the trim pots **R76** to **R79** located toward the rear center of the TNC PC board.

- Start up your computer, and enter command (cmd:) mode on your TNC. During the first part of the adjustment, it is helpful to have another receiver handy to listen to your output signal. If this is not available it doesn't matter.

- Enter this command from the command mode: **CALSET 438**. This is your MARK tone CALSET number for 1200 Hz tone.

- Remove the jumper from **JMP 8** and place on **JMP 9** pins 1 and 6. If you are facing your TNC pins 1 and 6 are on the far right.

- Type **CALIBRA** or **CAL**. Hit the letter **K** and then the space key to get the lower of the two tones. During this test you may have to remove the jumper from **JMP 5** to use on **JMP 4** to override the watchdog timer circuit.

- Adjust **R78** until you hear a change in pitch of the transmitted tone, and both the **CON** and **STA** LEDs light up and stay lit or at least alternate back and forth at the same rate.

The ideal situation is that they stay lit simultaneously.

- Hit the **K** key again, and then **Q** (to quit calibration) and then back to the CMD: mode again.

- Enter the command **CALSET 239**. This is the SPACE tone calset number for 2200 Hz tone.

- Repeat the previous steps, but adjust **R77** until the **CON** and **STA** LEDs stay lit. Hit **K** then **Q** when complete.

- Next, remove the jumper from **JMP 9** (pins 1 and 6) and place the jumper on pins 2 and 5, the center two pins of **JMP 9**.

- Go to CMD: mode and type **CALSET 157**. This is your Demodulator or Center frequency of 1685 Hz. **Note:** If you use your TNC only for reception this is the *only* adjustment you need to make.

- Again type **CAL** then the letter **K** and the space bar to select the lower of the tones. Adjust **R79** until both the **CON** and **STA** LEDs both light at the same time.

- That's all there is to it. Replace **JMP 8** (from **JMP 9**) and replace **JMP 5** (from **JMP 4**).

You have now successfully calibrated your TNC's tones and should experience a lot smoother performance from your setup, provided your chosen channel is not too busy.

Have fun with packet!

ICOM

Count on us!



## "VK3LZ calling!"

All the latest news from your friends at Icom.

### IC-W21A...It has to be the bargain of the year!

There are still a few of these units available at participating dealers for the incredible price of \$599. Call and I'll put you in touch with a stockist.

### IC-736 still in short supply.

The popularity of this rig has been such that it is still in short supply. Don't delay if you are going to order, it may be Christmas before stock is freely available.

### Latest HF under \$3000.

The IC-738 is the latest HF Unit and is extremely well priced under \$3000. It has loads of features including a built-in tuner.

Call for a brochure.

## "...73"

Call me at Icom on  
free call (008) 338 915  
ph: (03) 529 7582  
fax: (03) 529 8485

ACN006 092 575

LL BROWN ADVERTISING 4845



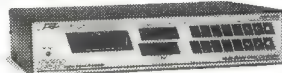
## PACKET RACKET

We wish to inform you that there are TNC's Made by AEA which provide multiple mode, multiple speed and multiple radio port TNC facilities to interface most transceivers, see below!

### AEA DATA CONTROLLERS

represent the most exciting value in amateur radio today. DSP/MULTI MODE DATA CONTROLLERS. The internal software provides all popular digital amateur data modes. Unique LCD read-out on the DSP-2232 displays the mode and diagnostics for both channel.

DSP-1232 \$1495 DSP-2232 \$1895



### PK-900: THE STEPPING STONE BETWEEN '223MBX & DSP-2232

With features borrowed from the '2232', plus unique additions: dual simultaneous ports, software selectable modems, 9600 baud modem & PACTOR, etc.

\$1250



### PK-232MBX: MULTI-MODE DATA CONTROLLER.

PK-232MBX, the world's leading multi-mode controller combines all amateur data communication modes in one comprehensive unit.

ONLY \$695



### PK88 HF/VHF PACKET TNC BEST VALUE IN PACKET RADIO!

The PK-88 is loaded with unique features and backed with proven hardware and software design.



ONLY \$295

### PK96-A HIGH SPEED PACKET CONTROLLER

Tired of waiting for packet data? Wish for an easy solution? Now there is one: the PK-96, a cost-effective, high-speed, single-mode data controller.



ONLY \$499

### PC-PAKRATT FOR WINDOWS

PC-PAKRATT for Windows makes control of your AEA Data Controller easier and more enjoyable! \$250

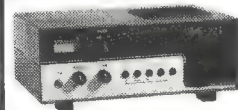
### AEA FAX II

Tired of waiting for Weather Reports on Television. Buy AEA FAX II \$275

**NEW-NEW-NEW-NEW-NEW**  
ST-1 SATELLITE TRACKER to control your KENPRO 5400/5600!

## SHORTWAVE COMMUNICATION RECEIVERS

At Emtronics you can source the largest range of Short wave Radios for professional, amateur and SWL. We also supply SW receiving antennas & accessories!



HF-225 only \$1450

LOWE ELECTRONICS presents two brilliant new receivers, with the awards:

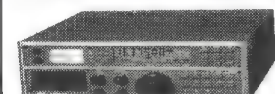
- \*Best Portable Receiver 1989/90. by World Radio Handbook!
- \*Most Innovative Design 1992/93. by World Radio Handbook!
- \*Best DX Receiver. by EDXC Conference 1992.

HF-150 only \$1050



### NEW AOR: AR3030

General coverage receiver with mechanical filter, DDS, and ECSS. AOR has introduced new standards in receiver design. With DDS, ECSS and Collins mechanical filters, brings the AR3030 receiver in the \$4000 class



\$1599

### AOR: AR-3000A

The "TOP" of all communication receivers-scanners is the famous AR-3000A. This multi-mode radio covers a freq. range from 100KHz to 2036MHz.

\$

1950

BEST SCANNER

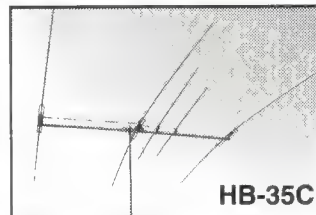


## TET-EMTRON ANTENNAS

TET-EMTRON antennas are Australian designed and made of best materials available, such as marine grade stainless steel hardware and 6063T83 drawn aluminium tubing. Specially machined heavy duty boom to mast & element to boom brackets, will keep TET-EMTRON antennas on your mast FOREVER!

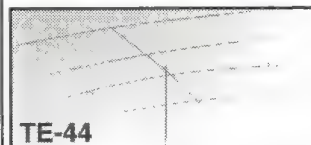
### THREE BAND BEAMS FOR 14-21-28 MHz BANDS

- TE-13 rotatable dipole .....\$199
- TE-23 2-element beam.....\$414
- TE-23M 2-ele. mini-beam.....\$440
- TE-33 3-element beam.....\$575
- TE-43 4-element beam.....\$750
- HB-35C 5-element trapless beam .....\$770



HB-35C

### FOUR BAND BEAMS FOR 7-14-21-28 MHz BANDS



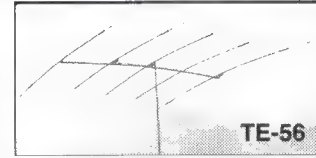
TE-44

- TE-14 rotatable dipole.....\$275
- TE-34 3-ele beam on 14-21-28MHz, 1-ele on 7MHz.....\$695
- TE-44 4-ele beam on 14-21-28MHz, 1-ele on 7MHz.....\$870

BEAT THE DX "SUN-SPOT" PROBLEM WITH THE NEW FOUR-BAND ANTENNAS

### SIX BAND BEAMS FOR 10-14-18-21-25-28 MHz BANDS

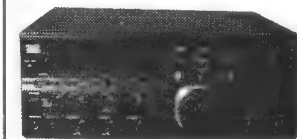
- TE-26 dual rotatable dipole.....\$380
- TE-46 3-ele beam on 14-21-28MHz, 1-ele on 10-18-25MHz.....\$750
- TE-56 3-ele beam on 14-21-28MHz, 2-ele on 10-18-25MHz.....\$950



TE-56

### JRC: NRD-535G

World's best short wave receiver. Superb features include double front-end tuned circuit, optional ECSS, band pass tuning, all mode reception, memories, search, scan & sweep and modular construction.



**LNA-3000** is a low noise wide band preamplifier for the freq. range between 50 to 3000MHz. Ideal for improving scanner



sensitivity, weather satellite, TV & radio signals, and to increase the sensitivity of test instruments!

### NEW AOR AR8000

AR8000 is a new breed of radio which combines full compatibility with computer and advanced wide-band receiver technology.



A highly sensitive hand-held receiver boasting a very wide frequency coverage of 500 KHz to 1900 MHz continuous. The all-mode reception provides AM, USB, LSB, CW, NFM & WFM, with independent 4.0 KHz SSB filter as standard.

50Hz resolution!  
**TOO MUCH TO TELL HERE! CONTACT US**



# EMTRONICS

**SYDNEY & HEAD OFFICE**  
94 Wentworth Ave  
SYDNEY 2000  
Ph (02)211 0988  
Fax (02)281 1508

**QUEENSLAND**  
633 Logan Rd.  
GREENSLOPES  
QLD 4120  
Ph (07)394 2555  
Fax (07)394 4316

**WEST AUSTRALIA**  
TOWER COM.  
Shop 3, 443 Albany  
Hwy, VICTORIA PARK  
Ph (09)470 1118  
Fax (09)472 3795

**VICTORIA AGENT**  
JOHN HILL  
Ph (03)700 5428



## THE 21<sup>st</sup> CENTURY COMM. RECEIVER IS HERE TODAY

### THE FABULOUS SoftWave

SoftWave is the first fully integrated digital communications receiver for Microsoft Windows.

SoftWave combines a high performance receiver, digital signal processor, spectrum analyzer, database and Windows program in one product. It opens the door to wireless communications on the PC.

#### GENERAL FEATURES:

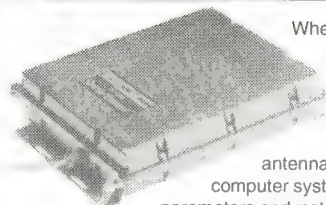
Includes HF receiver, VHF Scanner, AM DX Radio, World Map Radio, Digital Signal Processor, Spectrum Analyzer, Oscilloscope, Signal Constellation, Multi-Mode Demodulator, Decoder, Database and Windows program in one product.

**TOO MUCH TO TELL YOU - GET YOUR BROCHURE!**

**\$2995**



## The SG-230 Smarttuner HERE AT LAST

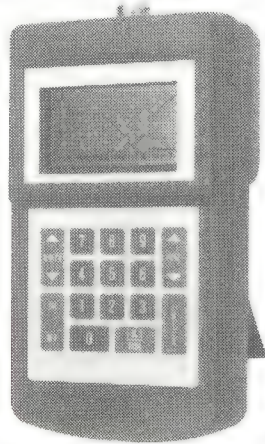


Whether you are a **HAM, LAND MOBILE, MARINE or AIR BAND** operator, you need a efficient antenna coupler. The best on the market today is definitely the SG-230 made in USA by SGC, Inc. The SG-230 is a fully automatic antenna tuner, with locking feature, where a computer system continuously monitors all antenna parameters and instantly selects the right values from more than half a million combinations in its matching circuit to make sure everything is perfectly tuned. With 500 position non-volatile memory build in, and a memory management program, there is only one word for **SG-230 HF AUTOMATIC ANTENNA COUPLER - RELIABILITY!**

**PRICE \$795**

### AEA SWR-121

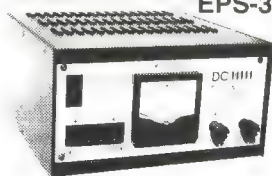
No matter, whether you are a professional antenna designer, antenna experimenter, or just analysing different antenna systems for max. performance, this microprocessor controlled freq. synthesizer with an accurate low-power SWR bridge is the answer. It shows a precise display of SWR curve, independent of the feedline. With optional software you can save plots on disk and control from your computers keyboard. Available for HF & VHF/UHF bands. **Call for brochure!**



SWR-121(VHF/UHF) \$859  
SWR-121(HF) \$795

### POWER SUPPLY GALORE

THE BEST 30A POWER SUPPLY AVAILABLE! EMTRON: **EPS-30**



This unique PS incorporates "4X" protection (voltage, current, temp. & RF) and a dual CROSS-NEEDLE meter for cont. monitoring of voltage current and DC power. **\$575**

### K205 SPECIAL



**\$295 \$295 \$295 \$295**  
+This unique new regulated power supply will run all your HF/VHF/UHF transceivers and can also be used for many other applications as well!  
INPUT 240V, OUTPUT 13.8V  
OUT. CURRENT 20A, 22A PEAK!

**KENWOOD &**  
Best prices from EMTRONICS



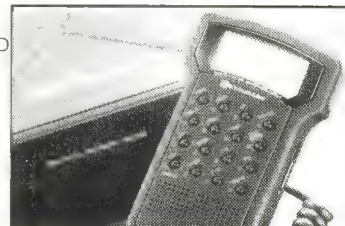
# STANDARD

### NEW TECHNOLOGY- NEW CONCEPT

No more "CRAWLING" under the DASHBOARD to read the dial. Now all controls are in your hand!

### C5718D

A new PACKET-READY, TWIN BAND 50W transceiver with out-of-the-box high speed, 9600 baud, interface for both VHF& UHF bands. Just connect your TNC. Build-in antenna duplexer. Wide band reception, 40 memories (200 memory optional). Full duplex with CTCSS tones. Many more exiting features! Call for brochure!

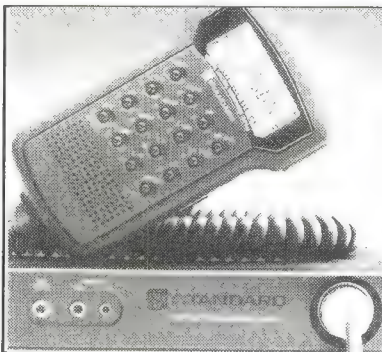


### C1208D

All your controls and display dial are in the **SPEAKER/MIC!**

A full featured 2-meter rig that fits anywhere, yet puts out a full 50 watts as well - that's STANDARDS NEW C1208D!

Super wide RX range, 100 memories, stores freq., offset & CTCSS tones and many other features!



**JRC**

**NEW**

## JST-145/245

HF/HF+50MHz transceiver

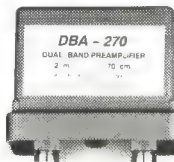


Complete with BUILD-IN SWITCHING POWER SUPPLY, AUTOMATIC ANT. TUNER, POWER MOSFET SEPPS SYSTEM and features that only a six page colour brochure can describe!

NEW from Germany!

## SSB Electronic presents

FROM SSB ELECTRONIC IN GERMANY COME THE WORLD'S BEST LOW NOISE MAST HEAD PREAMPLIFIERS! SEVERAL MODELS SUCH AS MONO-BAND, DUAL-BAND, WIDE BAND AS WELL AS DOWN-CONVERTERS FOR SATELLITE WORK ARE AVAILABLE! **LET US KNOW YOUR NEEDS!**



**DBA-270** Dual band low noise GaAs FET preamplifier with automatic RX/TX switch and 20db gain!

### FRX-2000

Two channel satellite receiver for METEOSAT, with DIGISAT software!



**UEK-2000 SAT** Special converter for "OSKAR" sat. reception. Build in LNA, noise fig. of 0.6db.



**SP-2000/SP-7000**, Hi quality preamplifier for 2m and 70cm band. Hi gain, low noise & coax. switching!



**MASTHEAD ANT. SWITCHES FOR ALL APPLICATIONS!**



**SP-13/SP-23** Low noise preamplifier for SHF (2.3 to 2.4 GHz & 1.25 to 1.3 GHz) Send for info!



# TOKYO HY-POWER HT-750

By Greg Towells, VK2GJT

**T**he HT-750 is a radio like no other offered to the amateur radio scene. No other radio available is quite like the HT-750. Billed as "...the world's first handy SSB/CW tri-bander..." the HT-750 is a tri-band hand-held transceiver covering segments of 40, 15 and six metres, with transmission modes of SSB and semi break-in CW, and an output of around three watts.

HF radios come in all shapes, models and sizes, with the notable exception of hand-held varieties. Radios covering six metres are few, and generally come packaged with HF bands as well. There are no six metre only portable transceivers currently on offer in the local market (although Kenwood's new TS-60 recently hit the market) and it is close on impossible to find one under \$1000 in the last number of years. And the only six metre hand-held available in Australia is imported in very small numbers by Melbourne's Strictly Ham.

The HT-750, however, comes from **Tokyo Hy-Power**, a company well known for its range of linear amplifiers. This radio is the company's first venture into the hand-held amateur transceiver market, and it is an impressive debut. The HT-750 slots into an area of the market which has been vacant for a long time. There have been portable six metre radios available in the past, but these tended to be more around the size of a regular mobile radio and only offered one band. Nothing else allows HF operation in a hand-held package, yet the HT-750 combines two HF bands with six metres in the one unit... and it costs less than \$1000.

Possible uses for this radio are absolutely endless. HF

mobile is an area which many amateurs would like to operate, however most radios around are far too big to fit into modern vehicles, and anyhow, those same vehicles barely have the space for a small CB radio, let alone anything larger!

The HT-750 could slot into anywhere in the vehicle with the antenna system of your choice and a linear amplifier if you thought it necessary. When you leave the vehicle, the radio is easily small enough to come along with you. There is no need to terminate your QSO when you arrive at your destination, provided conditions permit. Just attach the optional whip antenna and continue the contact whilst walking along!

Propagation on 40 metres during the early hours of the morning and evening are excellent for mobile and portable operation, perfectly suitable for drive-time operation.

Conditions on 15 metres have been really jumping

recently, despite the declining sunspot cycle, and a modest antenna system permits even QRP operations. Six metre operation is an unpredictable band on which DX is possible at any time.

Activities such as bushwalking and WICEN operations would be ideal situations for the HT-750 to shine. No other HF radio could be simply slipped into your backpack and taken camping as this one — just add some wire for a dipole and a simple tuner if you want for stationary operations.

Contacts around Australia, New Zealand and beyond could be expected with this radio and a simple antenna system.

The inclusion of six metres adds the unpredictability of that band and the possibility of interstate contacts as well as possible range of around 100 km with ground wave. Someone sug-

gested to me that the HT-750 would be great for those holi-





days where the 'better half' imposes a radio-free zone despite your pleas that you can't do without those contacts. The radio takes up little room in the baggage and you can slip away, keep in touch and still survive the holiday.

The HT-750 would appeal to CW addicts and QRP enthusiasts alike. The thrill of establishing a contact with low power is wonderful, particularly when you inform the other station that you are operating a hand-held! Adding the attraction of hand-held CW would be almost too much for many brass pounders...

I was promised a review of this radio some time back and was very anxious to review a hand-held HF/6m rig. I was expecting something quite a bit larger than the Tokyo Hy-Power offering. Actually the radio is only a little larger than most dual-band VHF/UHF hand-held rigs, and has a clean, uncluttered and modern look about it. The weight difference is substantial, however, probably close to double that of the aforementioned dual-banders. This seems to come mainly from the all-metal casing, giving the unit a very robust and dependable feel indeed.

The first impression would be that the outer casing would cause more damage to whatever it bounced off if you *did* drop it — an impression I did not put to the test, I hasten to add! The rounded ergonomic design of the top controls give the only hint of a modern radio design.

The radio is very Spartan with regard to controls and buttons compared to VHF/UHF HTs, sporting only volume, RIT and VFO tuning controls, and three buttons for noise blanker, dial lock and frequency stepping on the top panel. Also at the top is the received signal/power out meter, and it is certainly a nostalgic blast from the past.

It is a long time since I have seen a hand-held radio with an analog meter and it is well suited to SSB operation. Another quaint aspect of the meter is the tapping sound of the meter's needle being pinned by huge signals on 40 metres!

Unfortunately, I did not have the optional antenna kit for the radio so for these tests I used my humble multi-band vertical and dipoles and, for six metres, the trusty discone. I connected a patch lead from the radio to the incoming antenna cable and was immediately



rewarded with huge signals on 15 metres. It was only early morning but there was a great opening happening and signals from around Australia, JA and a few Europeans were making their presence felt.

A vertical antenna and only three watts out made for a bit of hard work getting contacts but it was immensely rewarding to get a reply. None of the Europeans came back to my calls but I managed a contact with a JA station and quite a few VK6s and a couple of ZLs. All commented that the audio was good and easy to listen to, despite some fading.

The surprise was evident in the voices of all my contacts when I informed them that I was operating hand-held QRP into a vertical. The comments on the audio and signal tended to improve

around that point and many of my QSOs were spent in describing the radio to them. There was one station way over there that did seem to think that I was having him on though... now you know I wasn't!

Sensitivity of the radio was great, right up there with the better radios that I have used.

The receiver is really quite hot and pulls in everything on frequency. Selectivity is reasonable too, although on a crowded band such as 40 metres in full swing there was a higher level of noise than I experienced on my usual radio.

Still, I noticed this only in a base station situation with a vertical antenna system, and the comparison radio is as close to perfect in this regard as I have found. Most people would never notice any deficiency in this area. In a portable or mobile setup you would have absolutely no problems. I found that turning the RX pre-amplifier off eliminated the cross-modulation problems on the band when big signals were experienced. The switch to turn off the RX pre-amp is located at the bottom of the radio. The noise blanker worked well to eliminate most of the difficult spikes that I experienced during my on-air testing. Many noise blankers that I have found only seem to work on one type of noise and bad luck about the rest. This one knocked off a variety of ignition and lightning crashes and I was quite happy with its performance.

For operation in low light conditions a back light can be enabled which illuminates both the LCD display and the signal meter. The switch to turn the light on is also located at the bottom of the radio. It's slightly difficult to locate in the dark, but you quickly become familiar with the radio due to the few controls and switches. The receive audio from the HT-750 was somewhat thin compared to my substantially larger comparison radio, but it was quite acceptable for decent periods of operation.

Again, it is difficult to compare this radio to anything else available as it is not designed as a base or mobile station.

I found that, when the environment became noisy during operation (kids, dogs and TV turned up in the next room), the audio from the HT-750

*continued over page....*



# TOKYO HY-POWER HT-750

(continued from previous page...)

punched through with ease. This makes it ideal then for portable use where there is rarely likely to be a quiet insulated room to operate from. It's more likely that the noises of the bush or the usual outside commotion of a city will annoy you.

I found the use of the lock button to be an absolute must once I had tuned in a station of interest. The free-wheeling VFO control does not tune in detented steps and is quite sensitive to touch. It is all too easy to bump the unit off frequency if it's not locked in place and, unless you remember the exact frequency you were on, there goes your contact.

Most mobile HFers would be able to verify that point, no doubt... After a short time it becomes second nature to hit the lock button immediately after locating a station of interest.

It would be just that touch easier if the lock button was the first button encountered at the back of the VFO control rather than the middle one, but it's good that it is there at all.

Operation on 40 metres was fun. QRP operation and my antenna system proved not too much of a handicap and I was able to accumulate contacts during the early evening with the HT-750. The radio really dragged in every signal and I received some good reports from many interstate stations. Tuning is easy and the stepping rate button facilitates frequency agility.

Three stepping rates are available: 1 kHz, 100 Hz and 20 Hz. You can spin the dial to get from one end of the band

to the other, narrow it down with the 100 Hz step and tune in those tricky signals or CW stations with the 20 Hz step. The stepping button is situated just nicely behind the VFO control.

I managed only a handful of local contacts on six metres, disappointing as the exotic DX did not coincide with my appearance. Despite the lack of contacts, I managed to copy a number of beacons so the band conditions were willing and the receiver again showed itself to be quite sensitive.

When I first unpacked the radio, the lack of buttons and dials prompted me to ponder just how I might change bands, modes, steps or just about anything beyond simply turning it on and transmitting. I prefer to leave the perusal of the manual part to last, and generally how far I get before I have to reach for the instructions is a good indication of ease of operation. The HT-750 turned out to be a really easy one to work out and there is no need to bring the manual along so that you can activate some obscure function or other.

As it turns out, changing bands, mode, CW break-in time and beep on/off are accomplished in one easy-to-follow sequence. Simply hit the function key located just above the transmit button to start the changes.

The function button located just where it is becomes somewhat of a trap, since hitting it instead of the transmit button launches you into the band/mode/CW/beep change and you have to wait

until next time to call the station. After you hit the function button, the band numerals (7, 21 or 50) flash and you change to each one by rotating the VFO control.

Hit the function key again and the mode indicator on the bottom row of the LCD display flashes, and you then cycle through the available modes until the one you want comes up. The next hit of the function key brings up the CW break-in time. The time period can be changed in increments of 0.1 seconds to 1 second in 10 steps. The final hit of the function key turns the beep sound on or off.

That completes the settings, and hitting the function key again clicks the radio onto the frequency and mode you have selected. Away you go and tune the band. If you are part way through the change procedure and you decide to return to the previous setting, just hit the function key twice and the unit returns to the previous setting.

A couple of minor complaints about the HT-750 came to light in the time I used it:

The unit is not supplied with a belt clip or hand strap nor does it have the facilities to attach these items. Given its size and weight you would want somewhere to hang the radio from after some time of hand-held operation. An ideal addition to this radio would be the purchase of a good leather or similar carry case which could in turn be clipped to the belt. Another possible problem observed by my assistant (thanks John)





concerns the location of three tiny switches for pre-amp, battery charge and display lamp. These switches are placed at the bottom of the radio. Obviously the designers gave thought to this problem since the metal shell of the radio extends a few millimetres further than the bottom of the radio, thus giving the switches protection — *IF* the radio is placed on a flat surface.

Problems may arise if the radio is placed on an uneven surface resulting in all the weight of the radio being taken on the switches underneath, possibly breaking them or pushing them up into the radio resulting in more damage. The obvious solution would be the procurement of that good leather case with some padding at the bottom to protect those switches. The HT-750 instruction manual states that among the optional accessories available is a leather case with shoulder belt/looped band. It may be well worth the extra money...

The antenna kit to suit the HT-750 is an optional extra and consists of three resonators and the base. The cost, which has not yet been finalised, is expected to be around the \$200 mark. Also available is the Tokyo Hy-Power all-mode amplifier, which is well suited for use with the HT-750.

The **HL-710** is rated at 10 watts output and, when used with the HT-750, will

automatically select the operating band, with a built-in automatic band selector. That would make this amplifier an ideal accessory to mate with the HT-750 for mobile work. The HL-710 will cost approximately \$400.

### CONCLUSION

The HT-750 is a very good performer and is simple to setup and use. The combination of two popular HF bands and the interesting six metre band into a hand-held unit opens up new spheres of operation previously impossible because of bulky equipment and power supplies. Operation in portable situations such as bushwalking, camping and WICEN activities would be well suited to the HT-750 and a decent operational range at most times of the day is possible because of the inclusion of 40, 15 and six metres, which have very different propagation patterns. An added plus for portable operations is the power options with the radio. There's no requirement for a specialised battery pack, as you can use either the common AA-size batteries (NiCd or alkaline) or a 13.8 volt external supply. In emergency situations, a 13.8 volt source or AA batteries would be a lot easier to come by than a battery pack made for a specific make of radio.

Also in an emergency situation CW can be a lifesaver mode and could cut

through the QRM where other modes would pack it in. A Morse key can be plugged into the jack on the side of the radio or alternatively, as the manual states, "...if you do not have a CW key, the PTT can be used instead...".

This radio is good value for money. Priced at

\$999, it costs less than single-band six metre radios and comes with two useful HF bands as well. The HT-750 could do duty as a HF/6m mobile with possible amp, go portable at the end of the journey, and continue on as a base station at the end of the day, replacing three radios. It's a good radio to consider if you travel a lot or require portable HF operations without all the fuss and bulk of a normal base transceiver, and with six metres thrown in. (Naturally six metre enthusiasts could reverse the order of that previous sentence and it would come up right.)

*The Tokyo Hy-Power HT-750 is available from Andrews Communications System*

### SPECIFICATIONS

#### Tokyo Hy-Power HT-750 Adv Price \$999

##### General

|                     |  |
|---------------------|--|
| Frequency Coverage: | 7.0 - 7.2999 MHz<br>21.0 - 21.4999 MHz<br>50.0 - 50.4999 MHz   |
| Modes               | SSB/CW   |
| DC Power Supply:    | 9.6 VDC (eight AA NiCd batteries)<br>12.0 VDC (eight AA alkaline batteries)<br>13.8 VDC External DC power supply |
| Dimensions:         | 66 X 188 X 47 (mm, W,H,D)  |

##### Transmitter

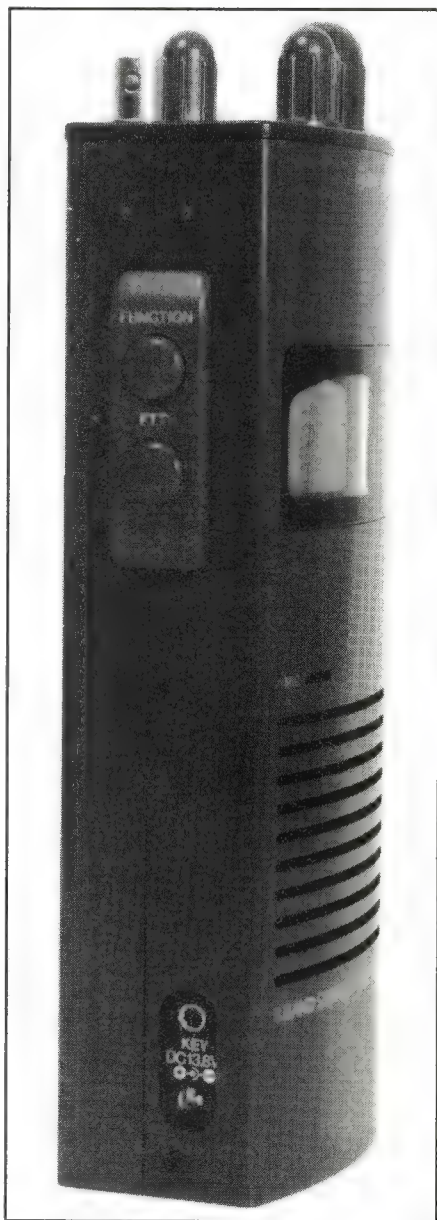
|                  |   |
|------------------|---|
| RF Output power: | 40m: 3 watts<br>15m: 3 watts<br>6m: 2 watts |
|------------------|---|

##### Spurious emissions:

|        |       |
|--------|-------|
| 40/15m | -40dB |
| 6m     | -60dB |

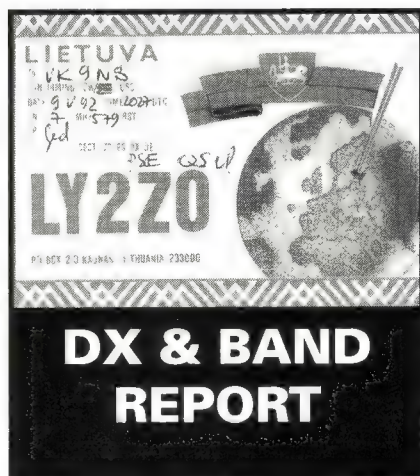
##### Receiver

|               |                                    |
|---------------|------------------------------------|
| Sensitivity:  | 0.3µV or lower (at 10dB S/N ratio) |
| Selectivity:  | 2.2 kHz (-6dB)<br>6.0 kHz (-60dB)  |
| RIT coverage: | ±0.5 kHz                           |
| Audio Output: | 0.8 watts                          |



**EQUIPMENT EVALUATION.....**





**A**ll is quiet on the DXCC front — that seems to be the word at the moment with nothing further on any of the potential additions to the DXCC Country List. The method of polling the members of the DXAC takes time, and in any case immediate changes do not really affect the actual situation of today.

There are still many DXers who need activity from several really tough ones... Bhutan, Tunisia, Libya and so on all come to mind.

However, without the continual search for the possible new DXCC country the program would lose a part of its heritage.

I was thinking about Scarborough Reef the other day, so I dug out my old 7J1RL QSL card — a contact I had during my time as P29JS. You know, I had actually forgotten just what the place *looked* like.

The picture QSL card is quite graphic, and shows that if you were looking for land available above the high water line you'd be very hard-pressed indeed to find any.

One can see what appears to be a few very large concrete blocks and metres of two-inch scaffolding — and that's about it.

If you have never seen the QTH of 7J1RL (now deleted) ask one of your DX friends if they have a card to show you — if they do you are in for a shock.

Of course, in the old days there were many countries which in today's outlook defy logic — yet I hasten to add that we (the DXers) chased Blenheim Reef, Minerva Reef and so on with a passion.

Well, we all know what DXers are like when they are chasing DX! However I have a feeling that today things are a bit different and at ARRL,

DXCC the decisions being made seem to be more controlled and valid.

However, it seems that whatever is done, there is that old saying "You can please *all* of the people *some* of the time, or *some* of the people *all* of the time, but you can't please *all* of the people, *all* of the time" springs to mind.

I am quite sure that if Scarborough Reef is denied, words will be spoken against any such a decision.

That's the name of the game...

In the case of the recent Principality of Seborga activation using self-assigned callsigns — well, this seems *totally* doomed to failure.

There have been a couple of 'damage control' measures taken, especially in the attempts to legitimise the issue of a valid callsign/licence.

(For example, there has been a move to get the Italian Telecomms involved to issue a special Italian prefix.)

Also Paul I1RBJ, has apparently recently approached the ITU requesting a unique prefix for Seborga.

In my view this sort of thing is a genuine case of putting the cart before the horse.

So the callsign structure has changed to I1RBJ/ØSØA, for example. A new DXCC country?? *Most* unlikely in my opinion.

Meanwhile, back at the ranch, the HF bands continue to provide a few surprises for the DXer who keeps looking around. And now, a bit nearer to home...

#### WHITE WHALE AWARD VI4WWA

Keep an ear out for the Hervey Bay Amateur Radio Club activation of the callsign **VI4WWA** for the annual migration of the Humpback Whale.

This is more or less an annual event by the club and I do have one of their Award Certificates from a year or two ago.

Incidentally, we had a couple of whale sightings from Norfolk recently.

Application for the Award or the special QSL card go to:

QSL Manager HBARC Inc,  
PO Box 829,  
Hervey Bay  
QLD 4655  
Australia.

NB: The certificate will cost you \$5.00.

#### SLOVAK, SPECIAL PREFIX OM9

I recently worked **OM9SNP** which

is active until the end of September. This is to commemorate the 50th anniversary of the Slovak national uprising during WWII.

**QSL Route: OM3LA**

#### BELGIUM SPECIAL PREFIX ON/OS

To celebrate the 50th anniversary of the liberation of Belgium in WWII Belgian radio amateurs can sign with the prefix **OS** from September 1 until December 31, 1994. So ON4UN, for example, can sign OS4UN.

#### MONACO SPECIAL PREFIX 3A5Ø

To celebrate the 50th anniversary of the liberation of Monaco in WWII the radio amateurs of Monaco can sign with the special prefix of **3A5Ø** during the period September 1 to 15, 1994.

It was sad to read that **Jean, 3A2EE** became a silent key on July 26 at the age of 61. J

ean was a very active DXer and I used his card(s) on several occasions — for DXCC, 5-Band DXCC and so on. He was also very active on CW, keeping Monaco available on this mode.

I am quite sure that many of the VK/ZL DXers have a 3A2EE card in their collection.

**W5ZPA** was active recently for a short vacation.

**QSL Route: 3A/W5ZPA** home call

#### CROATIA 9A

Now Croatia is not particularly rare, but **Jacky, F2CW** has finally surfaced from Croatia signing **9A5CW**. Jacky was in New Zealand a few months ago and I had a QSO with him while he visited Dusty, ZL2VS. Jacky is still with the Red Cross, and if you need any of his cards try his manager as follows:

**QSL Route: 9A5CW etc KC7V**

#### SOUTH GEORGIA VP8

I received another update on the projected DXpedition to South Georgia in early January 1995.

The main theme is that things are on track but that a substantial second payment is due in September for the boat charter. In addition, there are ongoing expenses to cover.

If you can assist please do so to the address given below.

The vessel is the **Abel-J** which was used for the VP8SSI operation from South Sandwich in 1992.



With a stay of three weeks planned, this should make South Georgia available to the needy.

However, I note that the north/south propagation should be good — this is almost always true, but becomes more apparent in times of low sun spot activity.

We may have problems in the VK/ZL areas...

There is still a need for a couple of good CW operators. The ante is currently US\$5000 per operator.

**QSL Route:**  
**INDEXA, W4FRU**  
PO Box 5127,  
Suffolk,  
Virginia 23435  
USA

**Financial Support:**  
SGI DXpeditions  
PO Box 2235,  
Melbourne,  
Florida 32902  
USA

#### LEBANON OD

Occasionally the signals from the Middle East areas can be outstanding on the long path openings on 20 metres, starting about 0400z.

However, the signal of **Faiz, OD5JY** was a rock-crusher the other day at 0415z. Faiz has been around for a long time and he used to be very active.

**QSL Route: CBA.**

#### WALLIS ISLAND FW

**Steve, AA6LF** continues his Pacific activity. He recently arrived at Wallis Island and signed **FW/AA6LF** for a couple of days. As he continues to sail around the Pacific he expects to be active from several areas.

**QSL Route: AA6BB/7**

#### FRANZ JOSEF LAND R1

I worked **Nick, R1FJV** on 20 metres SSB at 0539z the other day. This is the first time I have worked Franz Josef Land signing the new callsign structure of R1 which I mentioned in the column some time ago.

**QSL Route: RW3GW**

#### BELAU KC6

**Ted, NH6YK** has been very active from the Republic of Belau signing **KC6YK**, but he will be gone by the time you read this. However, he mentioned that from October 1, 1994 a

new prefix will be assigned to the republic, as Belau will no longer be administered in its present form. Ted had no idea what prefix would be assigned.

**QSL Route: KC6YK** to home call **NH6YK**

#### DELETED COUNTRIES

I am often asked about deleted countries — what happens to them?? Well, of course, like old soldiers they never die, merely fade away. There is not a single DXer who does not hope that somehow that his/her AC4, Tibet QSL card will somehow be good again.

Here's an example: those sitting on old ET cards from the '60s era for Eritrea suddenly had a good QSL card once again. A few like that would give many a DXCC edge almost impossible to beat — very similar to the situa-

tion of a few years ago. If you had not been licensed for 'yonks' (and a DXer to boot) how could you have China, Burma and so on confirmed? Recent years have been a great leveller in the DX scene.

However deleted countries do give a DXer status, since it does show that grand total. The grand total does indicate exactly how many were missed, although does not actually give the countries.

There are now 57 deleted countries, some of them easy, like Czechoslovakia, East Germany and so on. But there are some impossibilities, like Tibet and Sikkim and, nearer to home, Timor and so on. To read the deleted list is to remind oneself of

....

### DXCC STATUS

I have had several inquiries on the air and by mail about where the DXCC country total stands at the moment. In this column I try to keep the DXer informed on any changes to DXCC but I can see that without a list it is easy to forget where one stands as of today.

Basically, all of the deletions/additions have been as a result of changes in the international scene. The end of the 'Cold War' era has been a particular source of new calls! To refresh your memory, the current DXCC total is 326 countries and this came about as follows:

#### JANUARY 93

**4N/T9** Bosnia/Herzegovina ADDED.  
Effective date 15 October 1991 324

**9A** Croatia ADDED.  
Effective date 26 June 1991 325

**S5** Slovenia ADDED.  
Effective date 26 June 1991 326

#### JUNE 93

**A15** Abu Ail Islands DELETED.  
Effective date 31 March 1991 325

**OK** Czechoslovakia DELETED.  
Effective date 31 December 1992 324

**OK** Czech Republic ADDED.  
Effective date 1 January 1993 325

**OM** Slovak Republic ADDED  
Effective date 1 January 1993 326

**4N5/Z3** Macedonia ADDED  
Effective date 9 August 1993 327

#### JANUARY 94

**E3** Eritrea ADDED  
(Originally a deleted DXCC country)  
Effective date 24 May 1991 328

#### APRIL 94

**ZS1** Penguin Islands DELETED  
Effective date 1 Mar 1994 327

**ZS9** Walvis Bay DELETED  
Effective date 1 Mar 1994 326

**Current total is therefore 326 countries.**

#### Notes:

**1** In the background lurks **North Korea** which is in the unusual position of being a country (which we all know anyway) but until a valid operation takes place North Korea remains in limbo.

No further news from DXCC on the operation by Romeo.

**2** In recent years several petitions have been made for new countries, and all have been mentioned in this column.

Several were withdrawn and several were declined. These include the long-standing oldies like **TP2CE, 4U1VIC**.

**3** Currently the DXAC arena is occupied by Pratas Island, Scarborough Reef, the Marquesas, the Australes Groups and the Bellany Islands. Note too that Bellany has not been activated.



# DX & Band Report

what has happened from the '50s through to the present day history of just a few months ago. It is with the above comment in mind that I restate my belief that there will be a never-ending source of new ones for the DXer. The political map's redrawing will continue, as it has always done.

## COMMONWEALTH GAMES VE7

Well, the Commonwealth Games in Victoria, BC, are all go as I write this (*how many gold medals?!!* — and that man is a fish!!) and the special event station **CG7V** has been very active.

Operator Bill was happy to get Norfolk Island in the log and promised to pass along 73 to the Norfolk Island team. Commonwealth Games Victoria **CG7V** should be QSLed to:

**QSL Info: VE7RCN**

## CONGRATULATIONS...

...to Dave, **VK3EW** for finally working Zone 35 on 80 metres to complete his 5-Band WAZ. These African zones are really hard on the low bands. The final station worked was **9G1MR** who

is very active and QSLs quickly via his manager or direct.

## VIETNAM 3W

It was reported that **3W6JQ** was recently worked by VKs on CW and, according to Gary, **NH2G**, this station is genuine.

## QSL Info:

**JA1IED**,  
Toku Makiguchi,  
2-15-10 Kasuga,  
Nerima,  
Tokyo 179  
Japan.

## PORTUGUESE CALLSIGN PREFIXES

Changes have been announced in the **CT** prefix structure as follows;

**CT2, CT5, CT7, CT8**

Mainland Portugal.

**CU plus any number** Azores

**CT3, CT9, CQ3, CQ9, CS3, CS9**

Madeira Islands

Note that the **XX** prefix is also permitted but *not* the allocation **XX9** which is used for Macau.

**CR** for national protection service  
All Prefix with Ø for national repeater service

## NOTES:

1 Callsigns with a one letter suffix are allowed for multi-operator contest and DXpedition stations.

2 Single operator stations can apply for special callsigns, but only with the same suffix (eg **CT1EEB** could ask for **CS6EEB** and so on).

Foreign operators granted reciprocal licensing will sign **CT1/Home** call-sign.

## Note also:

**CT1, CT4**

Mainland Portugal — no change.

**CU**

Azores — no change

**CT3**

Madeira Islands — no change

It is said that further changes may be made, since several Portuguese radio amateurs have asked for further extensions to the prefix structure.

## ALBANIA ZA

How quickly things fade into the background! I hardly ever think of **ZA** these days, but I *know* its operators are active. There is often a **ZA** active on 30 metres CW, for example.

For **ZA1A** there are several QSL routes, as follows.

**ZA1A** September 1991

**NCDXF (W6OAT)**

**ZA1A** July 1992 HF operations to

**OH2BBF**

**ZA1A** July 1992 VHF operations to

**OH2BC**

**ZA1A** CQWW Operation

**AARA** Box 66, Tirana, Albania.

**ZA1A** CQ WPX CW 1994

**OK2ZW**

## W7RO QSL SERVICE

**W7RO** has run his QSL Service for 13 years and has now decided to call it quits. He estimates having handled over one million cards and I can well believe it.

**WF5E** has now taken over the service and users should note the change of address.

## WF5E DX QSL Service

Les Bannon,  
3400 Bedford,  
Midland,  
Texas 79703  
USA

*So that is about it once again. I have a major problem with my Emotator rotator, which is an oldish 1102/1103 series model. Sadly, I received a fax the other day from the agent of the company in Japan, with the sad advice that spares are no longer available for this model — ah, well. Low band activity has been curtailed a bit due to satellite activity and a major attack on DX QSL cards. To keep ARRL DXCC busy — as I heard they were sitting around with nothing to do (just joking, Paul and gang!) — I shipped several hundred cards for updating 160, 80, 40 and 10 metre DXCC totals.*

*I have a supply of the correct DXCC application forms courtesy of ARRL HQ. If you want one, an SAE will have one in the mail to you.*

*To those who keep me informed on the bands and via other means, many thanks. It is often hard to come to terms with band conditions, but a CQ will usually result in some response even if signals are down in strength.*

*A special thanks to the following DX outlets who keep the DXer informed.*

**QRZ DX., LES BACORES DX, LONG SKIP, JA-59 MAGAZINE, JA-DX NEWS, RSGB DX NEWSLETTER, DXPRESS, W6GO/K6HHD MANAGERS LIST, LYNX DX BULLETIN, LES BACORES DX, ETC ETC.**

**73 JIM VK9NS**

**IF YOU HAVEN'T READ  
CB ACTION MAGAZINE  
RECENTLY  
YOU'RE  
MISSING OUT  
ON SOME  
INTERESTING  
ARTICLES**

- \* Scanner reviews and scanning frequencies
- \* Reviews of communication type software
- \* Short wave schedules and information
- \* Modification for almost everything
- \* 11m DX info
- ...and much more
- CBA is on sale  
bi-monthly at most  
newsagents**



# ISLANDS ON THE AIR (IOTA)

By Jim Smith, VK9NS, PO Box 90, Norfolk Island, South Pacific 2899

The poor HF band conditions are taking their toll on IOTA hunting, and we have missed out of a few in this part of the world. However Mal, VK6LC appeared more or less on schedule and activated the rare Sir Edward Pellow Group in the Gulf of Carpentaria. Signing **VK8ISL** he was quickly allocated an IOTA number as the group was previously un-numbered. So OC-198 has now been allocated to the group.

Mal was operating from North Island and I was interested to hear that the visit was possible due to the aboriginal owner giving permission. It was also nice to hear the owner have a few words to say when Mal opened up. It was a nice touch. By the way, it seems that Vegemite, as well as being great for a few dBs gain on antennas, is also great for catching fish. Wave the fish hook over an open jar and bingo! Don't believe me? Ask Mal about the fish they caught during his stay on North Island. Help ban drift net fishing and the illegal use of Vegemite!!! Protest to Mal.

The activity from the rare islands in the VE8 NWT by Tom, WT2O and Martin, G3ZAY were really hard from this part of the world. A couple of additions to the total were missed by most of us down here.

It is nice to note that gradually there is more interest in the IOTA program in the VK/ZL and Pacific area. It will take time, of course. Just a few years ago the interest in the IOTA program in the US was almost nil but now it has a steady following. It is nice to hear so many VK and ZL stations becoming involved in IOTA.

The sale of directories is on the increase and this is, in my view, the first essential step to be taken. It gives one an IOTA identity by means of a number and it immediately supports the program in real terms. Putting it another way, the financial support helps IOTA move a bit further down the track.

So despite the conditions there is still plenty of activity, and although it may be

harder occasionally to work the new one, it is nice to get yet another island worked.

The following have been worked from here with a couple of exceptions in the VE8 areas:

|  |                      |
|--|----------------------|
| AF-002                                   | Kerguelen Island     |
| FT5ZF                                    | QSL F5NNL (F1NNL)    |
| AF-004                                   | Canary Islands       |
| EA8BYL                                   | QSL EA8BYL           |
| AF-018                                   | Pantelleria Island   |
| IT9JOF/IH9                               | QSL IT9JOF           |
| AS-022                                   | Bears Island         |
| RK0QXY                                   | QSL RK0QXY           |
| AS-028                                   | Kotel'nyy Island     |
| UA0QBA                                   | QSL UA0KCL:          |
| Yuri Lobachev, Box 44, Pevek,            |                      |
| Magdalenskaya Obl, 68661, Russia.        |                      |
| AS-031                                   | Ogasawara Island     |
| JM1HBO/JD1                               | QSL JM1HBO           |
| AS-113                                   | Ma-tsu Island        |
| B0OM                                     | QSL BV2KI            |
| NA-046                                   | Nantucket Island     |
| W1UF                                     | QSL W1UF             |
| NA-075                                   | Gulf Group           |
| KE7EQ/VE7                                | QSL KE7EQ            |
| NA-075                                   | Gulf Group           |
| VE7BKF                                   | QSL VE7BKF           |
| NA-080                                   | Abacao Island        |
| KG9N/C6A                                 | QSL KG9N             |
| NA-096                                   | Haiti                |
| HH2LQ                                    | QSL HH2LQ            |
| NA-111                                   | Absecon Island       |
| W2GMA                                    | QSL info:            |
| Mel Toren, 2935 Sunset Avenue, Longport, |                      |
| NJ 08403, USA                            |                      |
| NA-111                                   | Long Beach Island    |
| W2OB                                     | QSL W2OB (Club Stn.) |
| NA-113                                   | S. Bahamas           |
| K5BDX/C6A                                | QSL K5BDX            |
| NA-194                                   | Big Island           |
| WB1CBY/VO2                               | QSL WB1CBY           |
| NA-194                                   | Big Island           |
| KA2SSJ/VO2                               | QSL WB1CBY           |

NA-195  
WT20/VE8  
NA-196  
NU2L/VE8  
Note:

NA196 are all new IOTA numbers.  
EU-019  
R1FJV  
EU-021  
DK2OY/TF  
EU-034  
ES1QD/Ø  
EU-087  
SM3CWE  
EU-099  
GJ3OZF  
EU-121  
EJ1D  
EU-128  
DJØMW/P  
EU-145  
CQ7P  
EU-150  
CQ2I  
EU-150  
CT1EEB/P  
EU-150  
CR1ENQ/P

OC-009  
KC6YK  
OC-012  
V63JC  
OC-016  
3D2DJ  
OC-043  
T31BA  
OC-043  
T31BB  
OC-044  
VR6BX  
OC-048  
ZK3UC  
OC-085  
FW/AA6LF  
OC-088  
V85BG  
OC-088  
V85PB  
OC-169  
A35MW  
OC-198  
VK8ISL

SA-002  
VP8CQG  
PO Box 260, MPA, Falkland Islands, South Atlantic.  
SA-051

Paterson Island  
QSL WT2O  
Flaherty Island  
QSL G3ZAY  
NA-194, NA195 AND  
Franz Josef Land  
QSL RW3GW  
Iceland  
QSL DK2OY  
Saaremaa Island  
QSL ES1QD  
Aino Island  
QSL SM3CWE  
Miniquiers  
QSL G3OZF  
Irish Coast Group  
QSL EJ1D  
Fehmarn Island  
QSL DARC or CBA  
Pessegueiro Island  
QSL CT1QW  
Biera/Minho Group  
QSL CT4NH  
Insua Island  
QSL WA1ECA  
Insua Island  
QSL WA1ECA  
Palau Island  
QSL NH6YK  
Panape Island  
QSL V63JC  
Fiji  
QSL DJ9KH  
Canton Island  
QSL DL1DAZ  
Canton Island  
QSL DF6FK  
Pitcairn Island  
QSL VR6BX  
Tokelau Group  
QSL 5W1UC  
Wallis Island  
QSL AA6BB/7  
Borneo  
QSL V85BG  
Borneo  
QSL V85PB  
Lifuka Island  
QSL VK2BEX  
North Island  
QSL VK6LC

Falkland Island  
QSL info:  
Las Aves

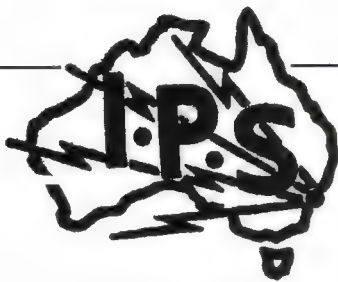
## BINT SERVICES FOR ALL YOUR QSL CARD REQUIREMENTS

Matte or gloss, white or colored, fully customised to suit your own needs or pre-printed.

100 fully customised cards cost as little as \$19.50 plus postage.  
Send a 95 cent stamp to cover return postage for samples and prices to...

**BINT  
SERVICES  
PO Box 622  
Mount Eliza 3930**





# Propagation

## East - England (short path)

28.5  
24.9  
21.2  
18.1  
14.2  
10.1  
7.2  
3.6  
1.8  
0.9  
MHZ !  
UT 00 06 12 18 24

...  
..%  
%  
AAFFFFF%F%  
AFFFFF%  
FFFFF  
FFFFF  
FFFFF  
FFFFF

## East - England (long path)

28.5  
24.9  
21.2  
18.1  
14.2  
10.1  
7.2  
3.6  
1.8  
0.9  
MHZ !  
UT 00 06 12 18 24

...  
..%  
%  
A. FFF% A AF%  
%FA  
A

## ABOUT THESE CHARTS

The data on these pages are graphs showing forecasts for expected HF operating conditions between Australia and a number of important DX destinations. The information they contain is prepared by **IPS Radio and Space Services**, a division of the federal Department of Administration Services. IPS monitors changing radio conditions - which are affected most greatly by fairly predictable changes in solar activity - and issues reports and warnings based on that data.

Stations in the eastern half of Australia should refer to graphs on the left hand page. The data on the right hand page is calculated for stations in the western half of the continent. Of course, if your location is in the middle of the continent try reading them *both* - then make an educated guess.

The horizontal axis of each graph represents the hour of the day expressed in Universal Co-ordinated Time or UTC ("Z"). The vertical axis lists specific point frequencies within reach of each HF amateur band.

The maps are easy to read. First go to the map which looks closest to the area in which you are interested. Look up from the time and across from the selected band to the point at which the two variables merge. Note which symbol - if any - appears at the intersection of the particular time and frequency combination for that area and refer to the legend (right) to find the sort of propagation most likely to apply. If the space is blank the forecast is not good - your time and frequency combination is unlikely to allow communication to the destination station.

## East - Central and East Coast USA

28.5  
24.9  
21.2  
18.1  
14.2  
10.1  
7.2  
3.6  
1.8  
0.9  
MHZ !  
UT 00 06 12 18 24

...  
..%  
..%F%  
F. %.. %FFFFF  
AAA. .... F%.. %FAA  
%F%FFF  
AFFFFF  
FFFFF  
FFFFF  
FFFFF

## East - West Coast USA

28.5  
24.9  
21.2  
18.1  
14.2  
10.1  
7.2  
3.6  
1.8  
0.9  
MHZ !  
UT 00 06 12 18 24

...  
..%  
SS%  
SSS%  
AAA%.....%SSAA  
%MSMSS%MS  
MSMSSSSM  
MSMSSSSM  
MSMSSSSM  
MSMSSSSM

## East - South America

28.5  
24.9  
21.2  
18.1  
14.2  
10.1  
7.2  
3.6  
1.8  
0.9  
MHZ !  
UT 00 06 12 18 24

...  
..%  
%  
FAFFFFF%F%..A AFFFFF  
FFFFF  
FFF  
FFF  
FFF  
FFF

## East - West Indies

28.5  
24.9  
21.2  
18.1  
14.2  
10.1  
7.2  
3.6  
1.8  
0.9  
MHZ !  
UT 00 06 12 18 24

...  
..%  
%  
F%.....  
AAA%.....%AAA AAA  
F%..%FA  
AFF%FF  
FFFFF  
FFFFF  
FFFFF

## East - Japan

28.5  
24.9  
21.2  
18.1  
14.2  
10.1  
7.2  
3.6  
1.8  
0.9  
MHZ !  
UT 00 06 12 18 24

...  
..%  
%  
%  
%  
%  
SMMMMSSS%  
SMMMMSSSSSSS  
MMMMMSSSSSSS  
MMMMMSSSSSSS  
MMMMMSSSSSSS

## East - Central Europe

28.5  
24.9  
21.2  
18.1  
14.2  
10.1  
7.2  
3.6  
1.8  
0.9  
MHZ !  
UT 00 06 12 18 24

...  
..%  
%  
AAFFFFF%F%..A AFFFFF  
AFFFFF%  
FFFFF  
FFFFF  
FFFFF  
FFFFF

## East - Middle East

28.5  
24.9  
21.2  
18.1  
14.2  
10.1  
7.2  
3.6  
1.8  
0.9  
MHZ !  
UT 00 06 12 18 24

...  
..%  
%  
%  
%  
AA AAF%F%F%  
F%F%F%  
FFFFF  
FFFFF  
FFFFF  
FFFFF

## East - North Africa

28.5  
24.9  
21.2  
18.1  
14.2  
10.1  
7.2  
3.6  
1.8  
0.9  
MHZ !  
UT 00 06 12 18 24

...  
..%  
%  
%  
%  
AA AAF%F%F%  
F%F%  
AFFFFF  
FFFFF  
FFFFF  
FFFFF

## East - West Africa (short path)

28.5  
24.9  
21.2  
18.1  
14.2  
10.1  
7.2  
3.6  
1.8  
0.9  
MHZ !  
UT 00 06 12 18 24

...  
..%  
%  
FF%F%F%F% A %  
..FF  
FF  
FF  
FF  
FF

## East - West Africa (long path)

28.5  
24.9  
21.2  
18.1  
14.2  
10.1  
7.2  
3.6  
1.8  
0.9  
MHZ !  
UT 00 06 12 18 24

...  
..%  
%  
F%F%F%F% %  
F%F%F%F%F%F%  
AAF%F%F%F%F%F%F%  
FF

## East - South Africa

28.5  
24.9  
21.2  
18.1  
14.2  
10.1  
7.2  
3.6  
1.8  
0.9  
MHZ !  
UT 00 06 12 18 24

...  
..%  
%  
%  
%  
MMM%MAA  
MMMMM  
MMMMM  
MMMMM  
MMMMM



# forecaster Oct 1994

## LEGEND TO SYMBOLS

- . Propagation is possible, but unlikely at this time and frequency on more than half the days of the month.
- % This frequency/time pair should allow communications on between 50% and 90% of the days of the month.
- F Your best bet: first "F" mode conditions should apply on at least 90% of days this month for the given time and frequency.
- E Propagation via the "E layer" expected on up to 90% of days of month at this time and frequency.
- P A fair mixture: up to 90% chance of a path using "F mode" and between 50% and 90% probability of an "E layer" path.
- B A good mixture: up to 90% chance of a path using either "E layer" or mixed "F" modes.
- M A good mixture of combined "F" modes - both first and second mode up to 90% of the time.
- S Second "F" mode conditions should apply on at least 90% of days this month for the given time and frequency.
- A High atmospheric absorption of the signal is likely - better to use a higher band. Too close to the ALF for good HF signals.

## West - England (short path)

```

28.5 .....
24.9 ..%%.
21.2 %%%%.
18.1 %FFFFF%.
14.2 ...AA AFFFFF%.
10.1 ..... FFFFFF%F
7.2 ..... FFFFFFFF
3.6 ..... FFFFFFFF
1.8 ..... FFFFFFFF
0.9 ..... FFFFFFFF
MHZ ! ! ! ! !
UT 00 06 12 18 24
    
```

## West - England (long Path)

```

28.5 .....
24.9 .....
21.2 .....
18.1 %%.
14.2 %FFF%... AA..
10.1 F
7.2 .....
3.6 .....
1.8 .....
0.9 .....
MHZ ! ! ! ! !
UT 00 06 12 18 24
    
```

## West - Central and East Coast USA

```

28.5 .....
24.9 .....
21.2 %.. %%%
18.1 %.. %F%
14.2 AA %%%%. %FFA
10.1 %%%FA
7.2 FFFF
3.6 FFF
1.8 FFF
0.9 FFF
MHZ ! ! ! ! !
UT 00 06 12 18 24
    
```

## Perth - West Coast USA

```

28.5 .....
24.9 ..%.
21.2 %%% %%%
18.1 FFF%.. %FF
14.2 A AA..... %AAA
10.1 FFFF%FFF
7.2 FFFFFF
3.6 FFFFFF
1.8 FFFFFF
0.9 FFFFFF
MHZ ! ! ! ! !
UT 00 06 12 18 24
    
```

## West - South America

```

28.5 .....
24.9 .....
21.2 .....%..
18.1 %F%%%. %..
14.2 FFFFFFFF%FF%.A %F
10.1 FA FA
7.2 .....
3.6 .....
1.8 .....
0.9 .....
MHZ ! ! ! ! !
UT 00 06 12 18 24
    
```

## West - West Indies

```

28.5 .....
24.9 .....
21.2 ...
18.1 %%.
14.2 FFFAA%.. %... A%FF
10.1 ...%F
7.2 %F
3.6 FF
1.8 FF
0.9 FF
MHZ ! ! ! ! !
UT 00 06 12 18 24
    
```

## West - Japan

```

28.5 %%%%. %..
24.9 %FMMM...%t..
21.2 %MMMMM%%M%.. %
18.1 SMMMMMSSSMF%.. SS
14.2 SMMSSMMSSSM%... SSS
10.1 SMMSSSSS%%SA
7.2 MMSMMMMMMMMM
3.6 MMSMMMMMMMMM
1.8 MMSMMMMMMMMM
0.9 MMSMMMMMMMMM
MHZ ! ! ! ! !
UT 00 06 12 18 24
    
```

## West - Central Europe

```

28.5 .....
24.9 %%%%.
21.2 %F%%%.
18.1 %FFFFF%.
14.2 ...AA AFFFFF%.
10.1 ..... FFFFFF%F
7.2 ..... FFFFFFFF
3.6 ..... FFFFFFFF
1.8 ..... FFFFFFFF
0.9 ..... FFFFFFFF
MHZ ! ! ! ! !
UT 00 06 12 18 24
    
```

## West - Middle East

```

28.5 %%.%....
24.9 %%%%.
21.2 MMMMMMMMMM%...
18.1 %MMMMMMMMM%....
14.2 MMSMMMMMMMMM%%%...
10.1 S SMMMMMMMMMMMMM
7.2 MMSMMMMMMMMM
3.6 MMSMMMMMMMMM
1.8 MMSMMMMMMMMM
0.9 MMSMMMMMMMMM
MHZ ! ! ! ! !
UT 00 06 12 18 24
    
```

## West - North Africa

```

28.5 .....
24.9 %%%%.
21.2 %%%%.
18.1 FFFFFFFF%...
14.2 ...AAA AFFFFF%.
10.1 FFFFFF%F
7.2 FFFFFFFF
3.6 FFFFFFFF
1.8 FFFFFFFF
0.9 FFFFFFFF
MHZ ! ! ! ! !
UT 00 06 12 18 24
    
```

## West - Wes Africa (short path)

```

28.5 .....
24.9 .....
21.2 %%%%.
18.1 %%. %FFFFF%.
14.2 FFF%AAAAAA AA..... %F
10.1 A %%%FA
7.2 FFFFFFFF
3.6 FFFFFF
1.8 FFFFFF
0.9 FFFFFF
MHZ ! ! ! ! !
UT 00 06 12 18 24
    
```

## West - West Africa (long path)

```

28.5 .....
24.9 ...%.
21.2 %%%%. %%%.. %
18.1 FFFF% FFF%.... %FF
14.2 AAA.. FFFFAAAA%... AAA
10.1 .....
7.2 .....
3.6 .....
1.8 .....
0.9 .....
MHZ ! ! ! ! !
UT 00 06 12 18 24
    
```

## West - South Africa (short path)

```

28.5 .....
24.9 .....
21.2 %%%%.
18.1 %MMMMM%.
14.2 %MMMMMMMMM%...
10.1 % AA ASMMMMMMMMMM
7.2 AMMMMMMMMMM
3.6 MMSMMMMM
1.8 MMSMMMMM
0.9 MMSMMMMM
MHZ ! ! ! ! !
UT 00 06 12 18 24
    
```



# WEATHER SATELLITES & REMOTE IMAGING

By Arthur Andrews, VK2AAE

**I**n the last article we looked at setting up an orbiting weather satellite receiving station and covered computers, decoders and receivers. Now we will have a look at amplifiers, antennas and connecting the lot together.

## Amplifiers

Although not absolutely necessary, a masthead amplifier can improve the quality of your reception especially where long runs of cable are involved.

A TV-type amplifier is not suitable due to its wide bandwidth.

To get the maximum benefit from the amplifier it should be tuned to the center frequency you want — say 137.60 MHz — have good gain and good out-of-band rejection of unwanted signals, the latter being especially important if you live in a noisy VHF area.

So an amplifier built for the job is the best way to go.

I have often been asked the question whether the masthead amp can be located in the shack instead of on the mast.

The answer is yes, but if you do this you are defeating the whole object of the amplifier, which is to amplify the signal at its strongest point to overcome the feeder cable losses to your receiver, as cable losses can be considerable depending on distance and quality of the feeder cable being used.

A masthead amplifier is self-descriptive; it is meant to be mounted at the head of the mast.

The best way to feed the amplifier with its required working voltage is through the coaxial feeder cable and most dedicated satellite receivers have this facility.

Otherwise you could use a power inserter in your cable or run the wires separately to the amplifier up the mast.

## Antennas

One of the fun things about the amateur/SWL/CB scene is that you can experiment with antennas, and there is no difference in the reception of weather satellites. There is plenty of scope for experimentation.

Probably the three most-used types are the *turnstile*, the *Lindenblad* and, to a lesser extent, the *J-pole*. Even an antenna designed for the two metre amateur band will work to a lesser degree.

I don't wish to go into antenna designs at this stage, but for those who want to get on the air quickly the construction of a simple turnstile antenna is the easiest way out. Personally I prefer the turnstile due to its ease of construction, ruggedness and portability. Using a good masthead amplifier I can get full horizon-to-horizon coverage from 5° South to 65° South from my location at 32° South. This is from the Russian Meteor satellites.

Turnstile designs can be found in any ARRL Handbook and other amateur publications. If you have any difficulty in getting a design send me a SAE and I will send you the construction details of a Turnstile that can be easily built from a trashed TV antenna.

The height above the ground of the receiving antenna is not critical, and I use a 4ft star picket banged into the ground for mounting antennas for testing purposes.

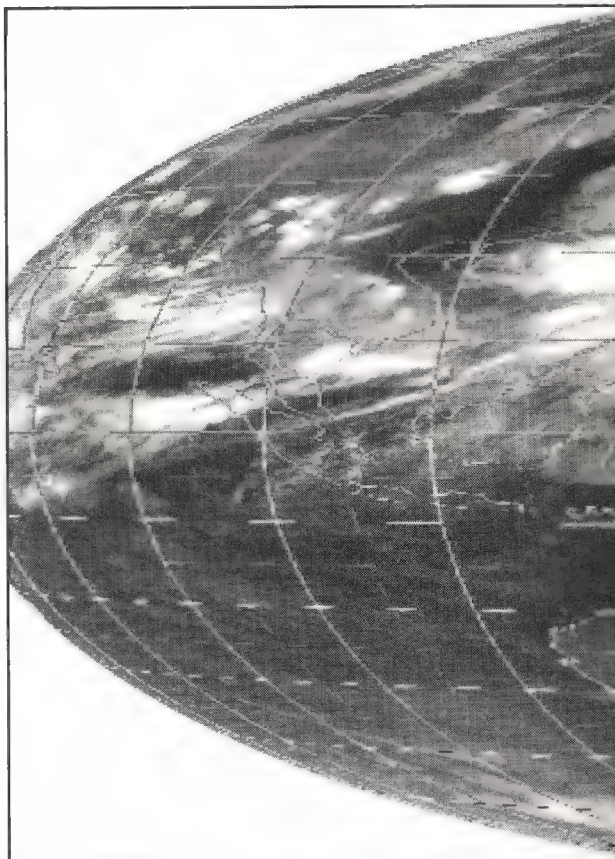
The essential requirement is that it has a clear view of the sky, and that it's free from nearby constructions which could cause reflections and fading. Mounting the antenna about 10ft above the roof line of your home should pro-

vide good coverage. For those who require invisible antennas the turnstile or Lindenblad can be mounted in the loft under the roof, with passable results.

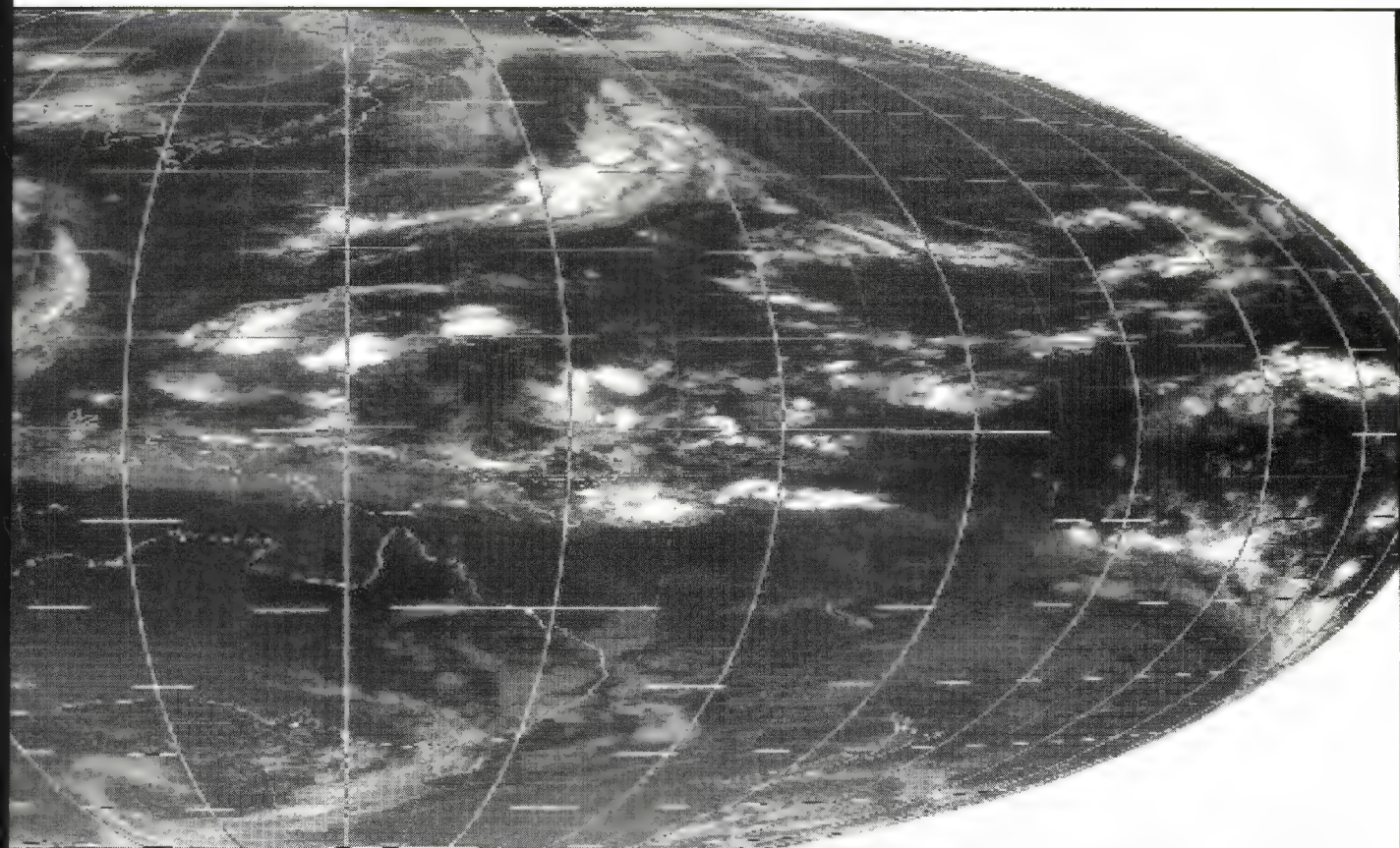
There are more exotic antenna designs, such as the *Eggbeater*, the *Quadrifilar*, the *Patch* and the *Volute* and more, and I hope to cover these in full detail in later issues.

For good, strong signals a Yagi can be used, but this must be kept pointing at the satellite as it moves across the sky. This can be accomplished if you are lucky enough to have an expensive az/el (azimuth/elevation) rotator, or even two ordinary rotators mounted at right angles to each other, but in most cases that would necessitate an expenditure of hard-earned cash.

A far cheaper alternative is to get the spouse or an obliging friend to hold the Yagi while you read off the bearings from your tracking program and tell him or her where to point it. This can be a bit frustrating though when having to shout "Keep the b..... thing pointed at the satellite!". Invariably when this happens you will generally find that you then lose the signal completely and, on further investigation, find the Yagi on the ground with you being told in no uncertain terms exactly where you can put it!







### Hook-up

To obtain consistently good, clear pictures I cannot over emphasise the need to use quality connectors and low loss coaxial cable. A bit extra spent in this area can make all the difference between passable and excellent pictures. I prefer the N-type connectors to the BNC type, but it is a matter of choice. PL259s will work but they are lossy. It is better to spend a few extra dollars and obtain quality connectors than get the cheaper types available over the counter at many electronics stores. Waterproof tape or water-repellent grease around the connectors at the mast end are good insurance. Also invest in good quality, low-loss coaxial cable, with RG213 your minimum requirement. Forget the cheap 1/4-inch cable — it is just not suitable.

Computer-generated interference (CGI) can be a big problem in the shack, and some computers are worse than others. Sometimes the interference is not generated so much by the computer as by the video monitor. Turning it off when receiving a picture is the easiest way to get over that problem.

If you are experiencing CGI try to locate the computer as far away from the receiver as possible to minimise the effect. Use good quality shielded audio

cable between the receiver and decoder. If the wires are fed through a couple of ferrite beads before connection to the audio plugs there may be some improvement in the interference level. There may be also interference coming in through the power leads. Wrapping the power cables around a ferrite rod sometimes helps. If all else fails you can always record your signals to tape and replay them later, providing your demodulator/software is capable of this function.

### Receiving the pictures

Providing your Keplerian elements are fairly up to date, your tracking software will show the position of the satellite you want to receive, bearing in mind that not all the satellites are on at the same time. Receiving no signal does not necessarily mean your equipment is at fault; maybe the satellite is switched off.

The best one to start with is **NOAA II** in the late afternoon as it is very rarely turned off. You should hear the signals shortly after it appears on the horizon (that is, the horizon as seen by the satellite relative to your location). This is known as the Acquisition of Signal time or **AOS**.

At first the signal will be fairly faint and the pictures scratchy, maybe accompanied by deep fades, but once it

has risen to about 3 or 4° above the horizon, clear signals should be heard.

Most wefax software has the ability to 'autostart'. In this scene, when synchronisation has been established with the satellite signal your computer will automatically start recording the picture. This of course is useful for unattended operation. If you do not want to wait for automatic start you can force the sync and straighten up the picture afterwards.

To receive a good satellite picture it is very important that the audio level is set correctly. Too loud and the picture will be predominantly white with little or no detail. Too soft and the picture will be predominantly black, again with little or no detail. Most dedicated receivers have a fixed audio level output to the decoder card and audio adjustment is either made through a pot on the card or in some cases by software adjustment. Once these adjustments are made the audio level will be the same each time you turn the receiver on. This is far better than trying to control the audio level by means of the volume control on the receiver as in most cases the volume control is also the on/off switch so the volume has to be adjusted each time the receiver is turned on.





# WEATHER SATELLITES & REMOTE IMAGING

(continued from previous page...)

To make sure that you have set the audio to the correct level, reference should be made to the grey scale data bars at the side of the NOAA infra-red image. If your receiver has the correct IF bandwidth and the audio level is correct you will see a distinct demarcation between the levels. This can quite clearly be seen (**below**) in the left-hand picture (**Figure 1**), which was received on a dedicated receiver.

As a matter of interest, the center picture (**Figure 2**) was received on a modified scanner and, although the audio settings were correct, there is less definition between the levels due to the bandwidth not being quite right. However, the pictures are quite passable for all but the most discerning critic.

The right-hand picture (**Figure 3**) shows what you do *not* want to receive. The grey scale is obliterated, probably due to a poor receiver, but it could have been too much audio — or, of course, a combination of both. It may take a few passes to adjust everything correctly, and there is nothing more frustrating than to wait another 100 minutes or so for the next pass to get things right. When it's all said and done, though, this sort of thoroughness is well worth the effort. It is very satisfying to be able to sit back and watch a clear picture unfold across the screen until the signal is lost (LOS). In the next article we will take a look at what is involved in geostationary weather satellite reception.

## A review...

Last month I said that I hoped to review a dedicated satellite receiver

made by Phil Webb and a demodulator for JVFax made by Kevin Cavanagh and, even though both were eager to have their products reviewed, nothing had turned up by this month's deadline, so I must apologise that these reviews will have to be put on the back burner for the time being.

When I first became interested in weather satellite reception I, like many, received my first pictures using the **SAT-FAX** software produced by Michael Delahunty and the decoder board manufactured by David Hopkins.

These products were designed for each other, something like love and marriage or horse and carriage to quote from a past popular musical, and have performed well over the past few years.

But Michael and David did not rest on their laurels, and through the post the other day I received the newest version of **MAXISAT** from Michael and the latest model of David's decoder board with an invitation to try them out.

Like a kid with a new toy I soon had the packages unwrapped and I was ready to go.

Now printed circuit boards don't really turn me on. I reckon when you've seen one, you've seen them all, so to speak. It's not what they look like but how they *perform* that interests me.

However, I did have a close look at this board which was neatly and well constructed with good quality components. It differed slightly from his previous boards, but the difference was more evident when I tested it later.

The board is designed to fit into a

spare expansion slot in the computer and one big plus is that the gain control pot is now situated above the audio input socket and adjustments can now be made quite easily through an access hole in the backing plate without having to have the top off the computer, which was fraught with danger if you happened to drop your screwdriver whilst trying to adjust the gain on the older-style cards.

The card comes with the backing plate separated so you can position the plate on the card to suit your machine.

It is surprising there is so much variance between machines and some cards cannot be screwed down however hard you try. Anyway David has quite cleverly got around that problem...

With the card inserted I waited for the next GMS picture to be transmitted and adjusted the gain control with a small screwdriver to give me the sharpest grey-scale definition.

The new card with increased filtering certainly did the job and the pictures produced were of high quality.

Next I waited for NOAA II to appear above the horizon and received the same good quality pictures with no further adjustment to the card. The insertion and adjustment of the card were quite painless, even to a ham-fisted individual like me.

Although designed to work with the SATFAX and MAXISAT programs the card also works with JVFAX, which is an added bonus for those who have that program. For those who prefer an external demodulator, David also produces his **Weather Fax Model G**, which can be connected to the computer's printer port with a standard RS232, 25-way cable (user-supplied).

I have purposely omitted all the technical details as I feel that readers would rather know how well it works in preference to *why* it works.

In summary, I found it easy to fit, easy to adjust and it produced excellent quality pictures from both the GMS and orbiting satellites. I wonder if David would notice if I returned my old board and kept this one...?

Technical details, prices and so on can be obtained from David Hopkins, 4 Handworth Street, Capalaba, Queensland 4157.

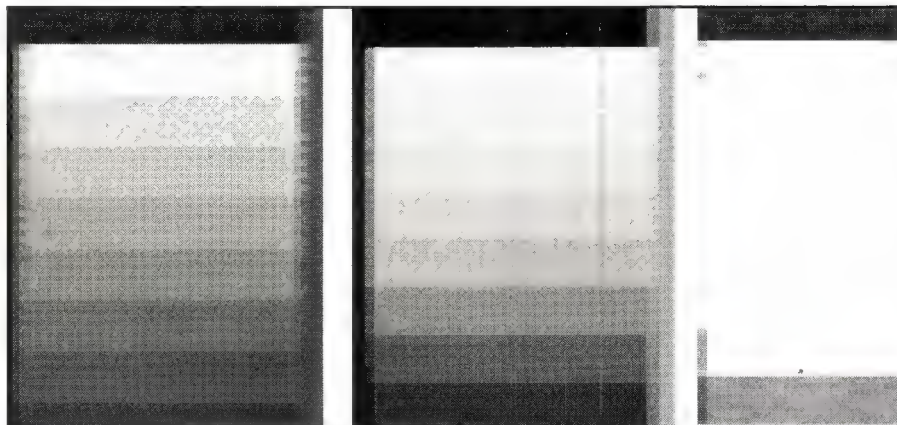
## The software...

While general purpose programs like JVFAX are an excellent introduction into remote image reception they are still a compromise. This is mainly due to the number of different modes that they can

Fig. 1

Fig. 2

Fig. 3





receive. I like JVFX, but for serious weather satellite study I prefer to use programs solely dedicated to that objective, such as those produced by Michael Delahunty.

It is a few years ago now that Michael first produced SATFAX, and many a budding novice in Wefax reception received his first picture using this software. Naturally, over the years, Michael has constantly upgraded this software and it is still an ideal program for those with older machines which will not work with some of the new sophisticated software available.

It was therefore with great interest that I heard Michael had developed a new program called **MAXISAT** and was very pleased when he made a copy available for me to have a look at.

To review all the features of MAXISAT would take up the whole of one article, so I will confine myself to a general description and features that I especially liked. A word of warning, though: this program is specifically designed for use with an IBM PC/AT or 386/486 compatible computer with 640 kb of RAM, MS-DOS version 3 or later, and a SVGA card and color monitor capable of 1024 x 768 resolution in either 16 or 256 colours. You would also require 2 mb of expanded memory or 4 mb of RAM running the EMM386.EXE device driver from MS-DOS 5.

You would also require at least 10mb of hard disk space for storage of pictures. One good pass of a Meteor satellite can take up to 1.7 mb of disk space.

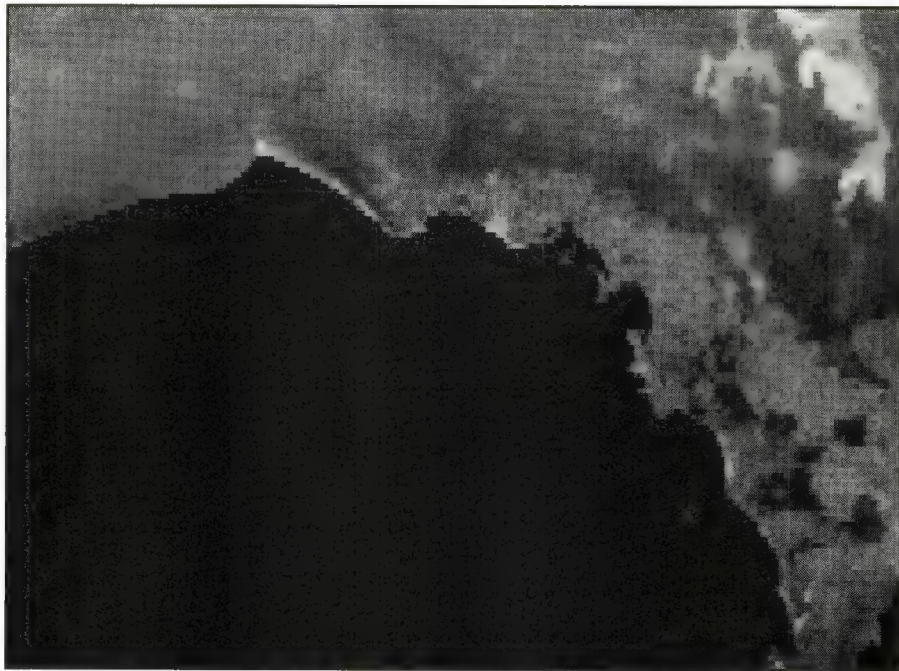
The package I received consisted of two 3.5-inch disks, one containing the program, the other 'Vesa' drivers, as well as a very comprehensive users manual giving clear instructions on the installation, setup and running of the program.

I quickly loaded the software and was ready to go — or was I, as the screen remained blank other than a small message informing that I did not have enough EMS memory. Oh well, as a last resort read the manual. This I did and with a small addition to my CONFIG.SYS file I was up and running.

I found the software to be very user-friendly and easy to use providing that I read the manual as I went.

Having set everything up I was ready to receive my first pictures and chose the GMS Disksave option.

At the sync tone the computer gave a couple of beeps and the first picture started coming through, very clear but



with a decided slope to the left.

No trouble. After the picture had been received I accessed the alignment feature which consisted of a white line down the screen which by using the cursor keys I was able to slant at the same angle as the picture. I then pressed enter and bingo! the picture was straight. I was then asked whether I wanted to keep the new settings and they were then loaded into the settings menu. You need only do this alignment once.

This feature also applies to the receiving of NOAA and Meteor satellites and your settings for correct picture alignment remain in memory. Using the Disksave option the four quadrant pictures from GMS were automatically loaded into memory and, looking at the files menu, I found an option Make GMS Globe.

Intrigued, I selected this option and was asked which file pictures I wanted to use. I selected the four separate quadrant pictures I had just received and, having selected View, was presented with a full globe of the Eastern Hemisphere, nicely fitted together.

This is the first software that I have come across which can do this and I love it. It also tends to prove the theory that the earth is round, but a sceptic pointed out that it may be only a flat disk and all you have to do is to flip it over like a coin to see the Western Hemisphere!

The reception of the orbiting satellites was equally impressive, and the clarity

of the images really excellent.

Because of the work Michael has put into the reception of the graphics it is possible to blow up the pictures to a far greater degree than most programs without distortion.

This is particularly handy if you want to study a specific area of interest.

The magnify, zoom and zoom box features work extremely well. There are other graphics enhancement tools, some of which I have not used yet, but they include 3D projection (which is handy in assessing cloud height), histogram manipulation including filters, and the relief effect which I particularly like as you can make your own embossed cloud picture.

There is a large range of color palette choices or you can custom make your own. Another feature is that you can export your pictures in CompuServe's **GIF** format to use with other graphics programs or to include within word processing files for the production of newsletters and the like.

You can if you wish print your pictures straight away as the software supports dot matrix, laser and bubble-jet printers. I liked the program. It is easy to use and has a lot of features of some of the more advanced foreign programs at a very modest price.

Details of SATFAX and MAXISAT can be obtained from Michael Delahunty, 42 Villiers Street, New Farm, Qld 4005. Phone (07) 358 2785.

*Cheers for now... and good satellite hunting from Arthur, VK2AAE.*





The following information was obtained from a number of sources including the Shortwave Possums BBS with "on board" credit to OPDX/BARF80 (Ohio/Penn DX Bulletin) with thanks to

the ARRL, Northern Ohio Amateur Radio Society, Northern Ohio DX Association, Ohio/Penn PacketCluster

Network, K4CEF & Southeastern Cluster Group, DJ5JH, DJOWQ, GOGWA, Z32GX, KN4F, AH6MM, KQ8M,

KB8NW, KL7Q and WB9OTX. It has been edited to omit specific USA only interest.

ARA wants to supply the best DX information available (as we believe we already do thanks to Jim Smith, VK9NS).

We would welcome regular input from VK and ZL stations, particularly from net controllers on a basis of heard/worked.

Please FAX Len Shaw (VK3ALS) on (03) 775 2575 (business hours) to have

your info included in this section.

### 3W VIETNAM

Reports from Japan indicated that JA1IED will be active from August 13-17th. His call-sign is unknown at this time, but if he is not issued a 3W6 callsign, he will sign 3W6/JA1IED. Suggested frequencies are: SSB - 21150-21200 and 14240 kHz / CW - 21010 and 14013 kHz.

### 9M8 EAST MALAYSIA

Dave, 9M8BT, continues to be active on 20 meters SSB and was also heard recently on 20 meters RTTY. Best times to look for him are between 1245 and 1500z. QSL via N5FTR. Johnny, 9M8DB, also has been active around the same time with a good signal. QSL via Johnny Tan, Box 1549, 98008, Miri, Sarawak, East Malaysia.

### 9N NEPAL

Well known "YL" DXer, Kyoko, NH6RT, was heard mid-August signing 9N1KY. She was heard one day on 14184 kHz at

1648z and on another day on 14270 kHz at 1700z. QSL via Kyoko Yamakami, Box 3, Tokaimura, 319-11, Japan.

### PJ7 SINT MAARTEN

Frank, AH0W/OH2LVG, will be returning to Residence la Chatelaine at Simpson Bay Lagoon the last week of September to be active in the CQ WW RTTY Contest and Scandinavian Activity Contest (both Sept.24-25th). The callsign PJ8X will be used during the contest and PJ7/OH2LVG outside the contest. QSL via KE7LZ. Jack, WA7LNW, will also be with Frank in PJ-land. The main purpose of the trip is to complete the antenna work that Chod Harris (Editor of the DX Bulletin and DX Magazine) and Frank started in May. Frank states that in the future, DXpeditioners who want to venture to Sint Maarten may be able to use this station for various contest weekends. Also, Frank and Jack may make attempts to activate Saba for the IOTA hunters.

### TT8 CHAD

Larry, F5IXR, will be active beginning August 18th for an unknown period. He will be signing TT8/F5IXR until he receives his TT8 callsign. He has requested the callsign TT8XR. QSL via F5MXH.

### V2 ANTIGUA

"Team Antigua", sponsored by the Frankford Radio Club, will once again be active from here, October 26th to November 2nd. Activity will be on 160-10 meters (including all the WARC bands), CW/SSB with a possibility of 6 meter and satellite operations (if time and conditions permit). Their main goal will be to operate during the CQ WW SSB Contest as a Multi/Multi station. The callsign during the contest will be V26B. V26A will be used before and after the contest. The operators will be AB2E, N3BNA/V26A, WT3Q/V26B, KA2AEV and possibly one or two more operators. Additional callsigns may be active from this group, but as of now V26A and V26B are the only ones issued. QSL V26A via WB3DNA. QSL V26B via WT3Q.

### VP8 SOUTH GEORGIA ISLAND (UPDATED)

Al (WA3YVN and VP8SSI co-organizer and operator), Jan (WA4VQD), recently founded the SGI DXpedition Group. Their vision is to organize and conduct DX operations from high demand DX locations around the world, including many of the low latitude Antarctic Islands. The group's first DXpedition will be to Grytviken, South Georgia Island for three weeks in January 1995. In a news release, all the DXpeditions gear for four complete HF stations was put aboard the Research Vessel "The Abel-J" in June at Fairhaven, Massachusetts.

WA3YVN accompanied the freight to Fairhaven and saw all of it safely stored by the ship's crew. The group is still looking

for one or two high caliber CW operators to complete the team.

The group is receiving good support from the DX community. However, at a cost of over fifty thousand dollars much more support is needed. The SGI DXpedition group still needs help with the cost of the charter vessel, generators, and fuel. If you would like to help, send contributions to: SGI DXpeditions, P.O. Box 2235, Melbourne, FL 32902. (Checks payable to SGI DXpeditions) Clubs and significant contributors will be noted on the QSL cards.

### VQ9 CHAGOS

VQ9TP has been quite active lately on several bands operating CW. Most of his activity is between 1230 and 1630z. He was heard this past weekend on 18083 kHz between 1345 and 1600z. For other frequencies, check on the bottom edge of the other bands 25 kHz (+/-) up. QSL via N5TP. Tom, VQ9TT, was also heard on 14014 kHz at 1300z.

### VR2 HONG KONG

Tom, VR2GC, has been heard most weekends on 20 meters CW. Check around 14015 kHz between 1230 and 1530z. QSL via G5JJ.

### CENTRAL KIRIBATI

T31BA and T31BB have been on the air a lot lately. Listen for them on 3795 kHz between 1030 and 1200z. Also try 40 metre SSB from 0600 to 1300z and 20 metre SSB between 2200 and 0400z. QSL T31BA via DL2ZAD. QSL T31BB via DF6FK.

### SAINT KITTS

V44KA0 has been quite active in recent weeks. He was worked on 7006 kHz at 0100z recently.

### SAINT PAUL ISLAND

The CY9DX DXpedition has been cancelled.

### CHAGOS

VQ9TP has been doing a lot of CW on several bands. Most activity is between 1230 and 1630z. He has been heard on 18083 kHz between 1345 and 1600z. Also check the low end of the other bands. QSL via N5TP. Tom, VQ9TT, was heard on 14014 kHz at 1300z.

### MONACO

Mike, W5ZPA, planned to sign 3A/W5ZPA from August 16 to 20. QSL via W5ZPA.

### AMSTERDAM ISLAND

FT5XJ has been signing FT5ZF, working mostly ZLs, Europeans, JAs and western USA. QSL via F5NLL.

### 3A MONACO AND 4U1ITU

Luciano, I1YRL, plans to be active from 3A



and 4U1ITU from mid August until November. There are no other details available at this time, other than he works mostly CW. ADDED NOTE: Also W5ZPA has announced he will become active from Monaco starting August 16.

### 3D2 ROTUMA

Ruvendra, 3D2RP, was heard active on 20 meters SSB recently.

### 3V TUNISIA

The DXNL reports that Ron, AA5DX, will be in Tunisia around mid August. No details on how long he will be there or if he is going to try to operate.

### 5R MADAGASCAR

Karl, 5R8KH, was heard recently on 21295 kHz around 1700z. QSL via WB8LFO.

### 9X RWANDA

VE3MJQ will be in Kigali for six months starting on August 15th. He expects to receive a callsign and will operate mostly on SSB. QSL via VE2PR. Also, a reminder that Alex, PA3DZN, will go to Kigali on an order from the UN and hopes to be active as soon as possible.

### IOTA ISLANDS

By the time you read this Martin, G3ZAY/NU2L, and Tom, WT2O, will be done activating a new IOTA from Hopewell Islands (now NA-195) in the Hudson Bay Quebec Coast North Group during August 13-14th.

They were also expected to be active from Belcher Islands (NEW IOTA) from August 15-18th.

If you got lucky, QSL WT2O/VE8 via WT2O and NU2L/V8 via G3ZAY.

### 5A LIBYA (SLIM OF THE WEEK? WFWL!)

A station signing 5AARG was active on 14242 kHz starting around 2240z for about an hour on August 26th. The operator stated his name was Ali and he was operating from Tripoli. A stateside station asked how to QSL to him and he replied he could not at this time. Ali was not just giving out 5/9 reports but would give an accurate report and was asking the stations he worked what kind of equipment they were using. Ali indicated he was using a vertical and an ICOM radio.

### OS BELGIUM

The DXNL reports that a special prefix of OS may be used by Belgium stations from September 1 until December 31, 1994. No details were given why.

### THAILAND

Fred, K3ZO, is in Thailand until October 10 and will be signing HZ0ZAR. Check 20 meters between 1130 and 1400z. He plans to give 40m a try for Stateside Qs. Sunrise in Bangkok is at 2307z and sunset at

1119z. Plans also call for a trip to Singapore to attend the IARU Region 3 Conference there. QSL via K3ZO.

### RWANDA

Both VE3MJQ and PA3DZN should be active now from Kigali...try working 9X5/F5PGP on 14195 kHz at about 2030z.

### UGANDA

Paul, WF5T, plans to return to Uganda and operate as 5X1XT, concentrating on CW and RTTY. QSL via his home call.

### CHINA

Len, W7MCU, called ARRL HQ recently to report that BY1QH is back on Oscar 13. QSL via the 1994 CBA.

### ARUBA

Contest station P40W will be rebuilt at a new location just prior to the CQWW SSB contest in October. John, W2GD, will be doing both the rebuilding and operating.

### 1A0KM STATUS

At the recent DXCC Forum, Bill, NC1L (of the DXCC Desk) announced that the latest 1A0KM operation has been approved for DXCC credit.

### 4U1ITU

Hannes, DL3NEO, was the mid-August operator at 4U1ITU. QSL direct to DK2ZB/Richard Roegner, Simonshofer STR 45, D-91207 LAUF, Germany.

### 7O1AA NEW QSL ROUTE AND STATUS

The INDEXA Net reported that operator Ahmed is safe in Jeddah along with the logs for 7O1AA. They also reported that

the equipment was lost in the war. Those who had a chance to work 7O1AA back in April, here is a new QSL route: Ahmed Nasser, P.O. Box 7198, Jeddah 21462, Saudi Arabia.

### 9G GHANA

The members of the Central Arizona DX Association will be very active in the upcoming contest season as they make plans for a DXpedition to Ghana. Their operations begin October 26th through November 4th and they plan to be an entry in the CQ World Wide SSB Contest, October 29-30th. Operators will be Vince/K5VT/9G5VT, Mike/AA7NO/9G5MB, Warren/KF7AY/9G5WH, Rod/NZ7E/9G5RM, Jack/WA7LNW/9G5JR and Millie/WY7K/9G5MT. Their contest callsign will be 9G5TL. The group will operate from the NOVOTEL, Accra, Ghana, West Africa. This is the first major contest operation from Ghana since 1982. Operations will be observed by members of the Ghana Amateur Radio Society. Outside the contest the group will have three stations working 160-10 meters including WARC bands.

Operation will include SSB, CW and RTTY modes. During the SSB contest the group will operate in the multi-single category. QSL 9G5TL via KG7XC, Jack Sheldon, Jr., PO Box 31898, Mesa, Arizona 85275-1898. QSL other callsigns via home calls.

A second group of members from the Central Arizona DX Association and friends from the UK (an all FOC group) will follow the SSB operation of 9G5TL to

....

## DXAC VOTE RESULTS

The DXAC (DX Advisory Committee) has voted 8 to 7 to reject a proposed revision to Section I.10 of the DXCC Rules to reinforce rules against the unethical action of making a contact for DXCC purposes with a call sign other than that issued to the operator.

The majority felt that this could adversely affect club and other multi-operator stations—including DXpeditions. The minority felt that this rule change was necessary to prevent observed abuses.

The DXAC also rejected (by a 14 to 1 vote) a petition for new DXCC country status for the Turkish Republic of Northern Cyprus - (TRNC). DXAC members stated that the TRNC did not meet DXCC Criteria Point 1, Government. In a third matter, the DXAC voted 11 to 4 to set a minimum size for new DXCC countries.

A DXCC country shall be a natural land mass of a size adequate to support a reasonable Amateur Radio operation. In the case of islands, the surface shall be dry at all times during high tide, and the physical characteristics may not be changed or modified. This includes the use of man-made operating structures. Each case will be judged on its own merits. Implicit in the recommendation is that operation from an island must take place from the surface of that island.

The minimum-size recommendation now goes to the Awards Committee for action.



# DX UPDATE...

|   |               |
|---|---------------|
| 4 ele 10-11   | \$198         |
| 5 ele 10-11   | \$239         |
| 6 ele log-yag array 12dbd 11M                       | \$381         |
| 2 ele Delta loop                                    | \$182         |
| NEW 10-11 M co-linear VERT 6dbd                     | \$175         |
| Duoband 10-15 3ele EA                               | \$259         |
| 3 ele 15 M  | \$259         |
| 3 ele 20 M  | \$292         |
| 5 ele 2 M   | \$75          |
| 12 ele 2 M  | \$115         |
| 80 M VERT top loaded                                | \$260         |
| M B Vert NO TRAPS 10-80                             | \$249         |
| 13-30log-periodic 12 ele all stainless/stl fittings | \$875         |
| TRI band beam no traps 5 ele                        | \$665         |
| 40 M linear loaded 2ele                             | \$469         |
| 6 ele 6 M   | \$192         |
| NEW 6M colinear vert 6dbd                           | \$150         |
| 2m & 70cm colinear vert N jack                      | \$95          |
| 2 M 2 5/8 co/lin vert                               | \$93          |
| 23cm 36ele BRASS-con assembled 18dbd                | \$170         |
| 70 cm 12ele/ 17ele B/feed                           | \$102 / \$127 |

**A.J. & J. COMAN**  
**(Antennas, TX & RX)**  
 Lot 6, Webesters Road,  
 Clarkefield, 3429  
 Ph: (054) 28 5134  
 ANDY VK3WH

L G055A.

Ghana for a multi-multi or multi single operation in the CQ WW CW contest, between November 20th to November 30. The contest takes place November 26-27th and their contest callsign will be 9G5NN. The following operators will be active from the same location as the first group: Mike/KC7V/9G5MF, Tony/N7BG/9G5TR, Jim/K7GE/9G5JR, Roger/G3SXW/9G5RW, Rob/GM3YTS/9G5RF and Chris/G4FAM/9G5CH. Like the SSB group, they will be active on all bands, all CW with some RTTY. QSL 9G5NN via G3SXW. Meanwhile, John, GM0FQV, arrived recently in Ghana and will be there working on a construction project for the next couple of years. John was signing GM0FQV/9G1, but as of late August he has received his 9G1JB callsign. He has been heard on 15 and 20 meters SSB recently around 2300z. QSL only to G4XTA.

## SV/A MOUNT ATHOS

Arie, 4X6UO (via N3KK), reports that a few German operators have just recently finished setting up RTTY equipment for Monk Apollo. SV2ASP/A was active on RTTY a few weeks ago, presumably to test the equipment. Apollo (SV2ASP/A) will be very active on RTTY (which is now reportedly his favorite mode) in October, or possibly sooner. The best time to catch him is on

Sundays after he has finished his work around the monastery.

## V5 NAMIBIA

In October, (during the CQ WW SSB Contest) a group will be active from Namibia. Their callsign has not been made available as of yet nor has the complete list of operators. Some of the operators that were mentioned are N0AFW, W5/AH9B and NH6UY. It was reported that Pat, NH6UY, is taking satellite gear on this trip.

## VK9MM CARDS (ANOTHER ROUTE)

Ken, V73C, and Murray, WA4DAN, who were operators of VK9MM DXpedition stated if anyone is having trouble getting a VK9MM card, send one card and a SASE to Murray, WA4DAN. Both Murray and Ken have copies of the VK9MM logs.

## YA AFGHANISTAN

OPDX has received QSN reports that there has been activity on 20 meters CW from a YA/RW6AC (with a weak signal). This station has not been heard since OPDX first reported it back in May and at that time there was an indication this station would only be there through the first week of June. Check around 14010 kHz between 1100 and 1230z. QSL to Box 16, Armavir, Russia.

# SUBSCRIBE TO AUSTRALIA'S ONLY CB MAGAZINE

L 082.CB

## Subscribe to CB Action NOW!!

- ☐ Australia 1 Year (6 Issues) \$22.50
- ☐ Australia 2 Years (12 Issues) \$40.50
- ☐ New Zealand 1 Year (6 Issues) NZ\$40.16
- ☐ Overseas 1 Year (6 Issues) A \$32.65
- ☐ Overseas 1 Year (6 Issues) A \$42.55
- ☐ Cheque payable to ACP Syme Magazines
- ☐ Please charge my credit card
- ☐ Amex ☐ M/Card ☐ Visa ☐ B/Card

\_\_\_\_\_

Expiry Date: ..... / .....

Signature: .....

Mr/Mrs/Ms: .....

Address: .....

Postcode: ..... State: .....

Telephone: (Work/Home) ( ) .....

**Return to (no stamp required):**  
**Reply Paid AAA1481,**  
**ACP Syme Magazines,**  
**GPO Box 55A, Melbourne 3001.**

ACP Syme Magazines  
 ACN 064 335 619

\*On the 2 year rate

*CB Action*





## SHORTWAVE LISTENING

All times are expressed in Co-ordinated Universal Time (UTC or 'Z'). Add 10 hours for Eastern Standard Time, 9.5 hours for Central Standard Time, 8 hours for Western Standard Time and 12 hours for New Zealand Standard Time).

### Voice of Friendship silent...

Those who observe the shortwave bands closely will already be aware that Christian station **KGEI**, based in San Francisco, has left the airwaves for good. More widely known in some quarters by its slogan 'La Voz de la Amistad' ('Voice of Friendship' in Spanish), KGEI was the US flagship of the Far East Broadcasting Company, which also operates **FEBC** in the Philippines, **FEBA** (Seychelles) and **KFBS** (Saipan).

The reasons for KGEI's demise are financial: scarce funds need to be applied in the most effective fashion possible, and this is seen by the Far East Broadcasting Company as concentrating its efforts in the Orient, where Christianity isn't as all-pervasive as in Latin America, KGEI's primary target area of recent years.

It is interesting to note that KGEI didn't actually start out as a Gospel broadcaster, and in fact the original transmitter was built by the General Electric Corporation in the late 1930s, appearing as an exhibit at the 1939 World Fair. Buoyed by public enthusiasm for what was then the novelty value of international broadcasting, General Electric moved the transmitter to a permanent location on the salt flats near San Francisco Bay where it operated as a semi-commercial venture. The war years saw KGEI commandeered by the US government, which used the facility to broadcast to areas in the Far East under Japanese occupation; the station carried General MacArthur's famous 'I Shall Return' speech towards the end of this period.

During the post-war years, General

Electric again took control and, together with Stanford University, broadcast educational and cultural programs to Latin America, building up a large following in the process. KGEI was sold to a Christian group in the 1950s, which also concentrated on Latin America, until finally FEBC (which had, a few years before, successfully set up its station in the Philippines) took over the reins in early 1960. During the Cuban 'missile crisis', the US government again made use of the KGEI facilities, this time to broadcast President Kennedy's messages to Latin America. A citation was subsequently awarded to the head of FEBC at the White House.

Further public service was rendered during the 1976 Guatemala earthquake, when KGEI transmitted messages to people in the disaster area from relatives living in the San Francisco area. KGEI and amateur radio were the only links to the strife-torn Central American nation during this period, in the absence of reliable phone lines.

Programming from KGEI has not been restricted to religious dogma, and much emphasis was placed on educational and health segments in its regular broadcasts. In addition to the Latin America target area, a few years ago broadcasts were also beamed to the Far East in Russian, Japanese and English. There was even a program for shortwave enthusiasts in the late 1970s, known as 'DX San Francisco'.

The fate of the 50 kW and 250 kW shortwave transmitters is as yet unclear, though it appears that there has been no shortage of offers. Although it is just over 20 years old, it is likely that the higher-powered transmitter will be shipped elsewhere and continue service in the Christian tradition. And so closes yet another interesting chapter in US broadcasting history.

Some of the background information on KGEI is acknowledged to HCJB's 'DX Partyline' and the 'World Radio and TV Handbook'.

### Hear St Helena

It's on again folks! What now appears to be an annual event on the shortwave calendar will take place on Friday, October 14, when Radio St Helena makes an appearance on 11,092.5 kHz. The time to check is 2000-2300z, and the mode is likely to be USB. In past years an on-air contest has been held, with listeners all over the world asked to phone in.

This is a rare opportunity to hear (and

**Compiled by Craig Seager**  
12 Pellion Place, Bathurst, NSW 2795

perhaps QSL) this isolated outpost in the South Atlantic, as Radio St Helena normally only broadcasts a low-power signal on medium wave. That is not to suggest that the shortwave transmitter is much more substantial; it is in fact a 1.5 kW unit, which will be borrowed from Cable and Wireless especially for the event. Just prior to the commencement of the transmission, look for the distinct interval signal, a trumpet call followed by a few bars of 'Life on the Ocean Waves'.

Reception reports may be sent to: Radio St Helena, Broadway House, Jamestown, Island of St Helena, South Atlantic Ocean.

Return postage is recommended.

### Thailand

The long-awaited initial broadcasts from **Radio Thailand's** external service finally commenced on August 11, via the Voice of America's super-powered relay base at Udorn Thani. The VOA's Dan Ferguson has provided this schedule:

**0000-0030z** English to South Africa on 9690 kHz  
**0030-0100z** English to the east coast of North America on 15,370 kHz  
**0100-0200z** Thai to the east coast of North America on 15,370 kHz  
**0300-0330z** English to the west coast of North America on 15,370 kHz  
**0330-0430z** Thai to the west coast of North America on 15,330 kHz  
**1100-1115z** Vietnamese to South East Asia on 7245 kHz  
**1115-1130z** Khymer to South East Asia on 7245 kHz  
**1130-1145z** Lao to South East Asia on 6040 kHz  
**1145-1200z** Burmese to Myanmar on 6040 kHz  
**1200-1215z** Malay to the Malay Peninsula on 11,805 kHz  
**1215-1230z** Indonesian to South East Asia on 11,805 kHz  
**1300-1315z** Japanese to Japan on 11,845 kHz  
**1315-1330z** Chinese to China on 11,845 kHz  
**1330-1400z** Thai to Japan and Taiwan on 11,845 kHz  
**1800-1900z** Thai to Saudi Arabia on 9690 kHz  
**1900-2000z** English to Scandinavia on 9700 kHz  
**2000-2015z** German to Europe on 9700 kHz  
**2015-2030z** French to Europe on 9700 kHz

....



## SHORTWAVE LISTENING (continued)

kHz

**2030-2045z** English to the UK on 9700 kHz

**2045-2115z** Thai to Central and Eastern Europe on 9700 kHz

Some minor modifications to this schedule are likely in early October, in line with the VOA's own seasonal frequency changes.

### AWR for Latin America

In April this year, under a canvas tent in pouring tropical rains, **AWR-Latin America** officially opened new office and studio facilities in Alajuela, Costa Rica. The building, formerly an orphanage, was remodelled to accommodate radio station needs: two on-air studios, five recording studios, a tape library, the engineering department, five offices and two apartments.

In addition to the studio/office complex, transmitting equipment is also being overhauled, and test transmissions continue to be heard on various frequencies during our evening period. The latest channel is the reactivated 5030 kHz, which is being widely heard with English programming after 0700z, through to past 1200z. AWR's first broadcast from a Latin American country was in August 1979 from Guatemala City, Guatemala. Broadcasts from this location continue today from a 3 kW transmitter on 5980 kHz, occasionally heard here around 1200z. In 1985 headquarters for AWR-Latin America were officially opened in Alajuela, on the campus of the Central American Adventist University. In 1989 AWR installed two transmitters, one of 5 kW and the other 40 kW, feeding log periodic antennas.

Further expansion has seen the purchase of transmitters from the former **Radio Impacto**, a controversial politically-motivated broadcaster, and the present site at Cahuita now boasts three transmitters of 50 kW and two of 20 kW. In past months, these transmitters have not all been on air at the same time due to local television interference problems, but AWR engineers now feel that they have the problem licked. The full list of frequencies to try is: 5030, 5970, 6150, 9725, 11,870, 13,750 and 15,460 kHz. The primary target areas are Mexico, the Caribbean, South and Central America, with programming primarily in English and Spanish. Future plans include the commencement of Portuguese programming within the next year.

This news from AWR's 'Current' newsletter.

### Still more AWR...

Without trying to place undue emphasis on religious denomination, it would be remiss not to mention some of the changes at **AWR-Asia** (Guam), which is now working to a revised schedule courtesy of its newly-introduced third 100 kW transmitter. For the Winter transmission period (which commenced 25/9/94), English programs are 1500z on 9370 kHz and 2300z on 11,980 kHz (finishing times not indicated in the published schedule).

'DX Asiawaves' for shortwave hobbyists is on Saturdays at 1500 and 2300z, Sundays 1500 and 2315z.

Interesting band-edge occupancies include 17,645 kHz 0000-0200z in Burmese and Bangla, and 7455 kHz for Mandarin Chinese 1400-1600 and 2100-2200z.

### Coming to a PC near you!

The terms 'Information Super-highway' and 'Cyberspace' are probably bandied about a little too freely these days, though both are undoubtedly expressions that we are likely to hear even more in the future.

There is hardly a major newspaper or technically-oriented magazine that isn't jumping on the futuristic bandwagon, assuring us continually that information technology is destined to become a large part of our daily routine within the current century.

It seems that shortwave stations have also joined the fray in a major sense, and it is now possible for many broadcasters to be contacted direct via the Internet, that global network of computer users which facilitates messaging and transfer of data concerning a wide number of special interests.

Internet access is still a bit of a bugbear for the average punter, though increasingly the network is becoming available to the layman through gateway organisations, albeit at a cost.

Perhaps the most innovative use of the Internet by a shortwave station is the **Voice of America's** recent introduction of its newscasts to the network via digitised sound files, which may be downloaded via a modem and 'played back' through one's personal computer.

A sound card would be a prerequisite, in addition to the appropriate software, which is readily available in commercial and shareware form.

The news bulletins are available in 15 languages, including English, Chinese, French, Arabic, Korean, Swahili and Ukrainian, with the English version

updated almost hourly. One drawback is the size of the files, something in the region of 2-3 MB in compressed form, which could work out a tad expensive for something that is available free via the airwaves. To view the innovation purely in this light would be missing the point, however.

The VOA states that the main aim of the exercise is to explore the possibilities of the technology, rather than attract existing audiences away from the hiss and crackle of their shortwave sets. For those with the appropriate access, the Internet address for the VOA newscasts is: [cw@neb.voa.gov](mailto:cw@neb.voa.gov)

Incidentally, the VOA is also making available its weekly 'Communications World' program available in a voice file, and the full text of English broadcasts has been accessible in text files since early 1994.

### Brazilian time again...

The Spring equinox is traditionally a good time for Australian listeners to hear the many shortwave stations which operate from Brazil and, as in past years, we can expect peak reception right through the month of October as well. Unlike most other Latin American stations, the Brazilians use the Portuguese language, which makes them easier to pick out from the crowd of Spanish speakers on the bands.

The difference between the two languages is hard to describe, although distinct, and is detectable only through experience; some say the Brazilian radio announcer's version of Portuguese tends to be more avuncular, with consonants rolled off the tongue in an exaggerated way when compared with his Spanish-speaking counterparts.

Propagationally, Brazilian signals behave very differently to those from other areas of Latin America.

The 'window' in which they are available is much shorter, generally 0700-0930z, depending on which part of the country they emanate from. Stations in the east of Brazil are difficult catches in Australia, whilst those in the extreme west of the country can propagate much like Colombians or even Peru and hence are somewhat more regular.

The following list is a useful starting point:

- 4765 kHz **Radio Intergracao**, Cruzeiro do Sul. Signs on at 1000z.
- 4805 kHz **Radio Difusora do Amazonas**, Manaus. The strongest of the 60 metre band stations, and heard



as late as 1130z some nights due to its location in the back blocks of Brazil.

- 4845 kHz **Radio Cabocla**, Manaus. A high-powered outlet, serving western Brazil and audible to 1200z (0900z sign-on).

- 4985 kHz **Radio Brasil Central**, Goiania. A weak signal, but fairly regular.

- 5035 kHz **Radio Aparecida**. A religious station, which is often also audible on parallel 6135, 9630 and 11,855 kHz.

- 6010 kHz **Radio Inconfidencia**, Belo Horizonte. A relatively easy one, but beware the Mexican, **Radio Mil**, which is co-channel 'til as late as 0800z some days.

- 6090 kHz **Radio Bandeirantes**, Sao Paulo. Suffers interference on this frequency, but may also be heard on 9645 and 11,925 kHz.

- 6180 kHz **Radio Nacional**, Brasilia. Heard from sign-on 0800z, but China interferes soon after.

- 9565 kHz **Radio Universo**, Curitiba. Perhaps the easiest of the lot due to its distinctive programming of religious doctrine, which seems to be read by the same announcer 24 hours a day!

- 9725 kHz **Radio Clube Paranaense**, Curitiba. Uses this, 6040 and 11,935 kHz.

- 11,805 kHz **Radio Globo**, Rio. Much easier now with KTWV (Guam) off the frequency.

Unless otherwise stated, all the above are available at some time within the stated 0700-0930z period. Reception varies nightly, so it is a good idea to keep trying if at first you do not succeed.

Such things as roosters crowing, farmyard noises, pretentious echo announcements and easily excitable announcers contribute to a flamboyance that can't be found on the broadcasts from any other country in the world. A good Brazilian night can therefore be a very unique experience!

#### Rwanda update

The Central African nation of Rwanda continues to make the news, and going hand in hand with political events and relief efforts are the attempts by various groups to win the hearts and minds of the Rwandan people via the airwaves. Here is the current state of play:

The government **Radio Rwanda** is operating erratically, apparently mostly on 6055 kHz, as reported by various European DXers. To date I've yet to find a trace of it, but the mostly likely reception time would be 1800-2100z. Another

frequency to check would be 3330 kHz, in the same time period.

An organisation calling itself '**Reporter sans Frontier**' (Reporters without Borders) is broadcasting on FM and shortwave to refugees near the border town of Goma (Zaire) in French, Swahili and Kinyarwanda using equipment provided by the French government.

Substantial funding for the exercise is said to have been provided by humanitarian groups and UNESCO. **BBC Monitoring** has been hearing what it thinks is this station on 6120 kHz at 0845, but it would be safe to presume that there is an evening broadcast also.

Meanwhile it could be some time before **Radio Deutsche Welle's** high-powered relay base near Kigali is again operational. Aside from the inherent risks in returning its personnel to the complex, the German national broadcaster has also indicated that there has been substantial damage to the transmitting equipment. I would expect that it may very well be 1995 at the earliest before the Kigali site is back on air. As a stop-gap measure, Deutsche Welle has rented airtime on transmitters at Meyerton in South Africa to supplement its coverage of the region.

#### News in brief

Some snippets from the bands plus a few topical loggings:

- **La Voz del CID**, one of the clandestine operations on shortwave targeting Cuba, is now operating to a regular schedule once again, after disappearing from the airwaves a couple of months ago due to funding problems. The frequencies audible in Australia are 6305.6 kHz (heard 0530-1200z) and 9941 kHz (observed 1200-1400z and again in our mornings), both carrying the 'Camilio Cienfuegos' program in Spanish.

- Christian station **Faro del Caribe** in San Jose, Costa Rica, is providing much improved signals on its 31 metre band outlet of 9644.7 kHz, suggesting new equipment in use. Reception has been at 1000z, but also earlier some days when a 24-hour schedule has been in play. The parallel frequencies are 5055 and 6175 kHz, and most programming is in Spanish.

- Another Costa Rican, **Radio Reloj** in San Jose, reactivated its 60 metre band frequency of 4832.4 kHz during August. This channel was a regular catch over many years before suddenly disappearing some months ago. A parallel frequency, equally well heard, is 6005.6

kHz. Both are audible 0530-1230z, though suffer varying amounts of adjacent channel interference during that period.

- **Radio Republik Indonesia** at Sorong has been heard with an extensive English program on a Sunday evening at 1100z on 4875 kHz. The segment is produced by the Australia-Indonesian Language Foundation and runs till 1130z. This does not appear to be on every week, though when aired does feature an interesting perspective on recent Indonesian history and the culture of the archipelago. English programming from RRI Sorong is nothing new, and some years ago there was a regular English segment every Saturday night at 1330z.

- **Radio Tirana's** Albanian language service is being heard on the split frequency of 6121 kHz at 0430z. Albania is notorious for operating away from its assigned channel (in this case 6120 kHz), causing heterodyne whistles to broadcasters nearby. Better results can be had on parallel 9760 and 11,705 kHz at the same time.

- According to **John Vodenik**, the **Voice of America** has announced plans to close its transmitter site at Bethany, California as part of new austerity measures being adopted at the station. This action, combined with imminent closure of the receiving station at Greenville in North Carolina, will mean the loss of several jobs. Understandably, affected staff are distressed at the moves and are vigorously campaigning against the closures through official channels and via shortwave hobbyists.

- New Zealand's **Print Disabled Radio** at Levin has finally commenced broadcasts on its new frequency of 5960.1 kHz, after announcing the move some months ago. Reception here has been in the upper side band mode until 0600z sign-off, and this would appear to replace 7290 kHz.

- **Radio Bangladesh** is using the new frequency of 9648 kHz for its English service at 1230z. The former 11,895 kHz (variable) has been deleted, though 13,615 kHz remains in parallel.

- '**Radio Intercontinental**' is the name of a new religious station operating from transmitters located in Armenia, of all places. An identification announcement is heard at sign-on 0530z on 15,400 kHz, followed by German programming until past 0600z. Signals are very strong in Eastern Australia.

See you next time. Cheers from Craig.



## SIX METRE REPORTS AVAILABLE ON PACKET...

**PAØHIP** runs a daily bulletin service from the Netherlands, from which most of the significant events can be obtained. This service had been running since 1989 and, although the reports lack lustre during the decline of the cycle, they have been a useful source of information and are very comprehensive.

Here is a recent report...

### 3 August 1994

Solar Flux 76: A-Index 6: K-Index (2400 UTC) 2

Solar activity was very low & geomagnetic field was quiet

Forecast for the next 24 hours:

Solar activity will be very low & geomagnetic field will be quiet

Prop: nil

### 4 August 1994

Solar Flux 75: A-Index 2: K-Index (24.00 UTC) 0

Solar activity was very low & geomagnetic field was quiet

Forecast for the next 24 hours:

Solar activity will be very low & geomagnetic field will be quiet

Es propagation:

10.15-13.10 UTC conditions to North east Europe (OH3, 5; UA1 TV; ES6)

10.45-11.15 UTC conditions to south of Spain (EH7)

12.00-12.20 UTC conditions to south of Spain (EH7)

### 5 August 1994

Solar Flux 76: A-Index 5: K-Index (24.00 UTC) 1

Solar activity was very low & geomagnetic field was quiet

Forecast for the next 24 hours:

Solar activity will be very low & geomagnetic field will be quiet

Es prop: 0850-1130 UTC. Several (10 minute) openings to Portugal (CTØWW)

### 6 August 1994

Solar flux 75: a-index 3: k-index (24.00 UTC) 1

Solar activity was very low & geomagnetic field was quiet

Forecast for the next 24 hours:

Solar activity will be very low & geomagnetic field will be quiet

Prop: nil

*This report from PAØHIP.*

## SIX A LA CARTE

• The YV4AB beacon was heard daily by KC4SUS (EL95) — without his making a single QSO!

• LA9ZV copied the FY7THF beacon on June 25 at 1640z.

• KC4SUS worked P4/OH1HJP in FK42 and WB4WTC worked P49T in June.

• V85PB will return home to the UK soon. QSL cards will be forwarded from the Brunei PO Box for nine months, or

you can try via G3ZSS and the RSGB Bureau.

• RMØR (PN53wc) appeared on Es at 2318z July 17 and worked into Japan.

• T97V Bosnia is QRV daily on 50.085 MHz CW from JN84vd at 1800z.

• G4UPS worked VE9AA and CY9/KØSN across the pond on June 15. A second opening on June 19 resulted in contacts with VE3FIT, W2CNS, VE1RAA, FP5EK, VE1PZ, K8MFO, WA1OUB, K8ZX, K1TOL, WB2ELB, WA1AYS and NW3C.

• JX7DFA Jan Mayen worked seven PA stations on July 2 using a 20 metre Delta Loop. (Nobody told the antenna it wasn't supposed to work there...)

• 1A0KM was fully operational from 160 to six metres on July 2/3.

• New stations from the Ukraine are UB1O (KN47), US7CQ (KN59), UTØMN (KN74), UU8JJ (KN74), UY5ZZ (KN68), UX1MF (KN98) and UXØFF (KN45). Thanks to G4UPS for this one.

• S9+ noise prevented W6JKV and K6MYC from making substantial contacts from VP2 in July. However, a total of 175 contacts were made on the only night that band conditions overcame the power line noise. Areas contacted were all US call areas, CO Cuba, KP2A, KP4A, VP2E and 21 EME contacts.

• VP9/WB4NFS worked SM6FHZ, SM6CMU, SM3EQY and SM7BAE on June

25.

• Bob ZL4AAA notes that our beloved 148 MHz pagers were heard in ZL on many days in July, but no amateur signals were worked, even after announcements on 50.110 MHz!

## BEACON NEWS

• According to OH1ZAA, the PJ2SIX beacon on 50.004 MHz is no longer operating. He adds that the OH9 beacons are all in a state of disrepair due to lightning strikes.

• OZ1DJJ repaired the defunct OX3VHF beacon during his recent visit.

• The TF3SIX beacon on 50.053 MHz has reappeared on frequency, but it now has a strange keying note.

• The Jordanian beacon is fully operational on 50.075 MHz running eight watts to a vertical, and signs JY6ZZ KM71wx. *Thanks to GJ4ICD and GJ3RAX for this item.*

• OH6DD advises that the OD5SIX beacon is QRV on 50.078 MHz; it was heard in June.

• The SK6SIX beacon on 50.080 MHz has not been heard during Es according to G4UPS.

• Canadian Arctic station VE8RAF is running a series of dits on 28.1925 and 50.0018 MHz, with a full callsign transmitted every three minutes.

• VK4AFL reported the VK7 beacon on 52.370 MHz on August 12 at 0400z.

• VK4RGG and VK3SIX were copied in respective states at the same date/time.

## SIX METRES IN CORSICA

You may not realise that six metre portable operations are *not allowed* in France or Corsica, although you can get a special authorisation to operate from your home QTH.

TK stations are not allowed to use the six metre band in Corsica. We have TV broadcasts on Channel 2, which is too close to the band. So all six metre activities done by holiday-makers in Corsica are illegal, and as such should not be recognised for any award or DXCC. A CEPT licence (which covers a number of European countries) does not permit one to work on frequencies not allowed in another country.

*From Patrick, TK5EP.*

Steve's comment: Seeing packet messages like this is very disturbing, especially as stations in Australia have claimed contacts with overseas six metre operations which have eventually turned out to be illegal.

Dr Tim Chan, BV2A stated emphatically at SEANET in Darwin (1991) that only the military could operate on 50 MHz in his country, which means that all QSOs made to BV before July 1, 1994, were *illegal*.

The Taiwan band allocations occurred officially on July 1 this year and include a narrow segment of 12.5 kHz for CW between 50.000 and 50.0125 MHz and a second segment from 50.110 to 50.1225 MHz for SSB.

In Italy the band starts at 50.150, not 50.110 MHz, and in France likewise.

Any legal contacts with Spain, Balears or Canaries will contain the EH prefix, not the EA prefix, so all EA8 contacts and EA8 portable contacts are also illegal. The FR/DJ3OS and EA6/DJ3OS operations are both regarded as illegal and QSL cards are not acceptable for DXCC or UK6MG award purposes.

A packet message from EH2LU indicates that permission to use 50 MHz has been prolonged for a period of three years and that 120 permits have been approved.

Release of the six metre band in every country so far has been promulgated by a news bulletin, usually via packet and then through the print media.



### VIGILANCE REQUIRED...

The June issue of a monthly journal carried a story that Telecom Australia has proposed to use the first five VHF TV channels as feeders for PAY TV — and that includes Channel 0.

Anyone aware of the problems in the USA using the 144 MHz band for cable TV distribution, will be disturbed by this report.

My spies also tell me that active work is being done behind the SMA scenes to modify the draft regulations still pending for the amateur service. The new provisions would see amateurs absolutely responsible for the cure of TVI, if necessary by closing down transmission completely.

Another jimmy-joy is the Aviation Regulatory Proposal for adopting the 49MHz wind-shear radar, currently on test in Darwin NT. Darwin's amateur's attempted to highlight this unwelcome intrusion into the bottom end of 50 MHz back in 1989, and I remember the frustration that Rex, VK8RH and Andrew VK8AH felt when they got little support.

And there was Misa on T32B, who had to go up on 50.1625 MHz to announce that he could only operate down on 110 metres when the wretched radar was switched off. It's closer than you think and if the ARP is accepted by the Airlines, every major domestic airport where 'heavy jets' operate could be fitted out with the system.

To refresh your memories, it runs 40 KW EIRP from 90 degrees up, to about 20

degrees elevation. It swamps 50 MHz for over eight kilometres with pulses.

### QSL MANAGERS

Although listed for six metre operations, these routes may assist in obtaining a card for HF operations as well:

**5B4JE** A Kaponides, PO Box 1723, Limassol, Cyprus.

**9K2ZR/USA** via K8EFS, MD Anderson, 4300 Sth Cochran, Charlotte MI, 48813 USA.

**CU1CB** via KN6BT Victor Garcia, PO Box 492, Salida, California 95368 USA.

**ER5OK** via I8YGG, Pino Zamboli Via Trieste 30, I-84015 Nocera Super, Italy.

**EU5R** via Bureau only.

**EW7IM** via UC2SMM, A Scherbo, Cialkovskogo 6-22, 21200 Mogilev, Belarus, CIS.

**EZ5AA** via DF7RX, B Steibl, KelheimwinzerStr 40, D-93309 Kelheim, Federal Republic of Germany.

**FP5EK** via K1RH, Ralph Hirsch, 172 Newton Road, Woodbridge, Connecticut 06525 USA.

**HB9QQ/HBØ**, Pierre Pasteur, Sunnhaldenstr 28A, CH-8600, Duebendorf, Switzerland.

**HV4NAC** via IK0FVC.

**JX7DFA** via LA7DFA Per-Einar Dahlen, 8099 Jan Mayen, Norway (1994-95 only).

**JY4MB** Mohammad S Balbisi, Box 3236, Amman, Jordan.

**JY7SIX** via G4CCZ.

**LA5TFA/P** Aasmund Birger, Jakobsen,

Graatindvn 1, N-9100, Kvaløysletta Norway.

**RA3YO** D Maksakow, U1 Proletarskoj, Diwisi 24-6, 241012 Brjansk, Russia.

**RA6YY** Alex Chalamow, PO Box 137, 32700 Maicop, Russia.

**US7CQ** via UB4CQ, Yuri Kazakov, PO Box 334, 257000 Cherkassy, Ukraine.

**UU8JJ** via UB4JDM, Oleg Vitko, Box 111, 334270, Alushta, Ukraine.

**UX0FF & UX3FW** via OE5EIN, Max Wagner, Aubrunnenweg 1, A-4020 Linz, Austria.

**UY5ZZ** via SP5CCC.

**YL2DX** via YL3AF, Uldis Silins, Box 3, LV-4200, Valmiera, Latvia.

**YL2MB** Nikolay Botsman, Box 1018, LV-4100, Cesis, Latvia.

### THE 50 MHZ DX BULLETIN

The Editor, Victor K6FV, is now calling for subscriptions for 1994/95. Just US\$25 (surface) and US\$30 (airmail) will get you a jam-packed bulletin which has news from every one of the 160 active countries featured in some way. If you read it second-hand you have probably missed the dx already.

The address to send your money is: 12450 Skyline Boulevard, Woodside, California, 94062-4541, USA.

### SOURCES

The 50MHz DX Bulletin. UK Six Metre Group News, SM7AED Newsletter, QRZ DX Bulletin via VK3AKK and JA1VOK, Five Nine magazine.

See you on the magic band. 73 de Steve VK3OT 6M DXCC #16

## Strictly Ham Pty. Ltd. A.H. 0414 456 616

### 14 Church St, Bayswater. VIC. 3153

### PH: (03) 729 7656 FAX: (03) 729 7422 ACN 059 638 407

#### ALINCO

DR-599T DUAL BAND MOBILE \$1199.00  
DR-130T 2M MOBILE \$599.00  
DJ-580T 2M/70CM HANDHELD \$829.00  
DJ-FIT 2M HANDHELD \$499.00

#### DIAWA

SWR POWER METERS FROM \$189.00  
DIAWA POWER SUPPL'S FROM \$279.00  
COAX SWITCHES FROM \$69.00

#### KENPRO ROTATORS

KR-400 \$595.00  
KR-400RC \$675.00  
KR-1000 \$1135.00

#### AEA DATA CONTROLLERS

PK-900 \$1250.00  
PK-232MBX \$695.00  
DSP-1232 \$1495.00  
DSP-2232 \$1895.00  
PK-96 SPOA  
PK-88 \$295.00

#### COAXIAL CABLE

RG-213/U \$175.00 PER 100M ROLL  
RG-58C/U \$95.00 PER 100M ROLL  
ALL COAX IS MIL SPEC

#### AOR AR-3000A

NOW IN STOCK THE  
AOR AR-3000A  
CALL FOR PRICING

#### TET - EMTRON

WE CARRY A GOOD  
RANGE OF TET - EMTRON  
ANTENNAS FOR WHATEVER  
YOUR HF REQUIREMENTS

#### BUSHCOMM ANTENNAS

BBA-100 POA  
SWE-100 POA  
SWC-100 POA

#### PAC COMM TNC'S

NB-96 POA  
PACTOR POA  
TNC-320 POA

#### KENWOOD AUTHORIZED DEALER

FROM THE WORLD'S SMALLEST HF TRANSCEIVER THE TS-50S TO THE  
FLAGSHIP OF THE RANGE THE TS-950SDX, WE CARRY THE ENTIRE RANGE  
ON THE SHELF.

### MELBOURNE'S BIGGEST KENWOOD SPECIALIST

#### ICOM AUTHORIZED DEALER

WE ALSO CARRY A LARGE RANGE OF ICOM RADIOS AND  
ACCESSORIES IN STOCK  
WE HAVE A LARGE RANGE OF DIAMOND ANTENNA'S IN STOCK

#### DUAL BAND BASE ANTENNAS 2m/70cm

X-30 3.0db/5.5db \$149.00  
X-50 4.5db/7.2db \$169.00  
X-200 6.0db/8.0db \$229.00  
X-300 6.5db/9.0db \$249.00  
X-400 7.9db/11.0db \$299.00  
X-510M 8.3db/11.7db \$389.00



#### TRI BAND BASE ANTENNAS 2m/70cm/23cm

X-4000 3.1db/6.3db/9.7db \$279.00  
X-5000 4.5db/8.3db/11.7db \$299.00  
X-6000 6.5db/9.0db/10.0db \$359.00  
X-7000 8.3db/11.7db/13.7db \$399.00  
WE ALSO CARRY DUPLEXERS AND TRIPLEXERS FOR WHATEVER YOUR  
REQUIREMENT FOR 10M, 6M, 2M, 70CM AND 23CM  
ALSO MOBILE TRIBAND ANTENNA FOR 2/70/23CM, 6/2/70CM,  
10/2/70CM, 15-10/2/70CM



# Andrews Communications Systems

EST  
1978  
ACN 001  
888 752



## DR-130T...\$629

HIGH-POWER 2M FM TRANSCEIVER  
50W, CTCSS EN, DTMF MIC., REV., WIDE RX.,  
MANY MORE FEATURES. ASK FOR COLOUR BROCHURES.

## ALINCO 3 YEAR WARRANTY

"Best Warranty in its Class"

MADE IN JAPAN

FACTORY DIRECT IMPORTER

- ★ DJ-180T 2m FM HANDHELD WITH DTMF & CTCSS encode .....\$429
- ★ DJ-G1 2m HANDHELD WITH with SPECTRUM SCOPE, DTMF SQ .....\$599
- ★ DJ-580TA TWINBAND H/H with DTMF & CTCSS en-decode .....\$829
- ★ DR-599T TWINBAND MOBILE WITH REMOTABLE FRONT PANEL.....\$1199

All include CTCSS encode and DTMF Keypad. Superb Quality. MADE IN JAPAN

## COMPARE ALINCO

### ICOM IC-736 "DYNAMITE"

100W 160-6M TRANSCEIVER...\$3499

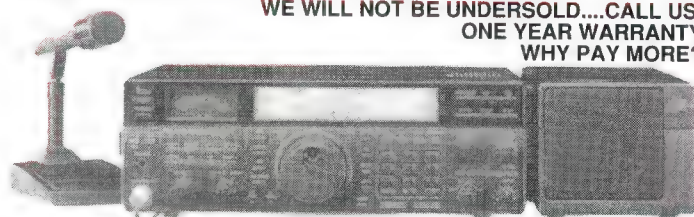
ATU, AC, HF WIDE RX + 45-60 MHz RX, VOX, 101 CH.

IC-738 HF...\$2599, IC-281H 2M...\$699,

IC-820H...\$2999, IC-R7100...\$2499

Much more ICOM available, just call us...

WE WILL NOT BE UNDERSOLD....CALL US.  
ONE YEAR WARRANTY  
WHY PAY MORE?



## ALL KENWOOD TRANSCEIVERS SEVERELY DISCOUNTED!

### EMOTATOR

JAPAN'S FIRST & FOREMOST  
ROTATOR MANUFACTURER

|        |            |        |
|--------|------------|--------|
| 105TSX | Med/H.D.   | \$549  |
| 747SRX | Heavy Duty | \$869  |
| 1200FX | S.H. Duty  | \$1499 |

FACTORY DIRECT IMPORTER.

### TRIBAND YAGIS

|                    |         |
|--------------------|---------|
| CA-33 (4m) 3 EL    | \$550   |
| CA-34 (5m) 4 EL    | \$600   |
| 40m option .....   | \$140   |
| 5-BAND VERTICAL    | \$249   |
| 3-BAND HF VERT.    | \$139   |
| 2M 6dB VERTICAL    | \$99    |
| 2M YAGI, 8 EL, ... | \$99    |
| 2M YAGI, 10 EL, .. | \$119   |
| HF HELICALS .....  | \$49 EA |

### "SUPER GAIN" YAGIS

|               |          |
|---------------|----------|
| 435-19, 15dBd | ...\$199 |
| 144-10, 12dBd | ...\$229 |
| 50-7, 10dBd   | ...\$319 |

COMPUTER DESIGNED, FIELD  
PROVEN, GUARANTEED TO OUT-  
PERFORM OTHERS OF SAME  
BOOMLENGTH OR YOUR MONEY  
BACK (7 DAY OFFER). CHOOSE  
FROM MANY DESIGNS.

### AMERITRON

HF LINEAR AMPLIFIERS

AL-1500 2.5kW...\$5,500  
Ideal for 80m "DX Window", hi!

AL-1200 1.8kW...\$4,750

Great for Europe on 40m, hi!

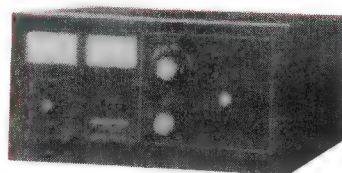
AL-82 1.8kW...\$4,500

AL-80B 1kW...\$2,750

AL-811H 800W...\$1,799

AL-811X 600W...\$1,399

BREAK OUT OF THE "LOW SUNSPOTS" DOLDRUM. SOME MODELS INDENT.



## GO HI-POWER NOW!

### DATA CONTROLLERS

AEA PK-88 ... \$289, PK-232P... \$629

KANTRONICS KPC-3 ... \$269

KAM PLUS W/G-TOR ... \$699

MFJ MFJ-1276 Packet HF/VHF, \$339

MFJ-1278B Multimode, \$599

MANY MORE CONTROLLERS AVAILABLE ...



### MFJ-1278B CONTROLLER

BEST PRICE ON AR-8000...Call  
YUPITERU MVT-7100 h/h...\$999  
RANGER SG-230 ATU...\$749  
TRADE-INS AT GREYSTANES  
STORE.  
WHY PAY MORE?

BUTTERNUT HF  
VERTICALS...HERE  
HEIL INSERTS...CALL  
HUSTLER 5BT \$295 IND.  
JRC, LOGIKEY, M2, CALL

TOKYO HY-POWER HF-VHF-UHF LINEAR AMPLIFIERS,  
TRANSVERTERS, RF WATTMETERS, HT-750 SSB/CW HAND-  
HELD 7/21/50MHz TRANSCEIVER, ETC. AVAILABLE INDENT.

CALL FOR AUSTRALIA'S BEST PRICES ON ALL  
MFJ-KANTRONICS-AOR-BENCHER-  
KLM-MIRAGE-RF CONCEPTS-TIME  
WAVE-UNIDEN-AEA-DIAMOND.

EIMAC 3-500Z \$325 EA, 572B \$190 EA., MANY TUBES AVAIL.  
4CX-1500B \$450 EA...CALL, 4X150A 4CX250B USED CALL.  
RF POWER TRANSISTORS & OUTPUT MODULES IN STOCK, CHEAP.

ALINCO DM-250MVZ 42/35A POWER SUPPLY KIT, ADJ. 3-15V \$799  
TERLIN TAPPED HELICALS...CALL FOR PRICES, ETC.

CALL (02) 349-5792 OR 344-7880  
795 ANZAC PARADE,  
MAROUBRA, N.S.W., 2035  
"BUY DIRECT FROM THE IMPORTER"  
FAX: (02) 349 3366

CALL (02) 636 9060 OR 688 4301  
SHOP 8, 41-51 BATHURST ST.,  
GREYSTANES, N.S.W., 2145. FAX: (02) 688 4301  
WHY PAY MORE? SOME ITEMS INDENT

NEAR GREAT WESTERN HWY. WE ACCEPT BANKCARD, MASTERCARD, VISA CARD

GG90ARA



# ...CLASSIFIEDS...CLASSIFIEDS...CLASSIFIEDS...

## ADVERTISERS PLEASE NOTE

All classified advertising copy is typed in by non-amateur typists who, reasonably enough, cannot decode illegible writing. In short, they type what they see and if your writing is poor you can expect either errors, or the non-appearance of the advert. PLEASE ENSURE THAT YOUR CLASSIFIED IS LEGIBLE AS ALTHOUGH YOU KNOW WHAT YOU'RE ADVERTISING A TYPIST DOESN'T!

### VK1 AREA

- **Sony** ICF-2001D comms rcvr, completely new, with AC adptr, hdpns. With Sony AN-1 amplified antenna, ext ant kit, wave hndbk, 1yr guarantee \$780. Dominic (06) 247 6575

### VK2 AREA

- **Antennas** HB-35C \$350 ono; 12-el 2m \$125; 15-el 70cm \$90, plus various lengths of Belden coax VK3CSH/2 (049) 73 3344
- **ETO** Alpha 89 HF linear amp, uses two Eimac 3CX800A7 triodes \$7500.
- **Icom** IC-738 HF xcvr (new) in carton, \$2600. Patricia, VK2SUS (02) 897 5440. Licensed amateurs only.
- **Hallicrafters** SX-117 & HT-44 sep xmtr & rcvr amateur bands, manuals & spare tubes, **Asahi** SWR/pwr meter, **Como** com-preamp, all VGC, all working. Consider part-trade for all-band vert or 3-el triband minibeam or \$450 the lot. Mannie, VK2WMS (02) 489 6546. Licensed amateurs only.
- **Icom** IC-271A & IC-471A complete with UX-14 converters & CT-16 satellite interface unit \$1500 pair. **Cushcraft** circular-polarised satellite antenna (two 20-el 2m & one 16-el 70cm) \$350. **PacComm** Tiny-2 TNC \$180. **Azden** PCS-5000 2m xcvr \$380. **MFJ**-1270 TNC fitted with PacComm 9600 baud modem \$400. **MFJ**-1274 TNC fitted with PacComm PSK-1 modem \$400. All of the above in GC & with manuals. Ask for Nigel, VK2KJU (02) 621 8939. Transmitting gear sold to licensed amateurs only.
- **Icom** IC-751A fitted with Icom 7515 pwr supp and Icom AH-2 long wire ATU \$2500.
- **Icom** IC-271H 2M all-mode xcvr \$1400. **Kenwood** TS-440S HF xcvr \$1550. **Heathkit** SB-230 linear amp \$500. VK2SH (02) 809 4263. Licensed amateurs only.
- **Icom** IC-R71 comms rcvr

### CAVEAT EMPTOR — BUYER BEWARE

*The acceptance of classified advertisements in the Amateur Radio Action classified advertising section does not warrant in any way that the goods offered are available, free of any encumbrance, in working order or otherwise satisfactory. The purchase of goods by private sale does not offer the purchaser any protection under law, and buyers should be certain the goods under consideration are suitable for the purpose for which they are required. Amateur Radio Action cannot accept any responsibility for goods advertised in the classified pages and no correspondence will be entered into regarding such goods.*

with manuals, box, variable bandwidth filters \$950. **Yaesu** FRG-8800 comms rcvr with VHF converter, manuals \$650. Both rcvrs like new. George, (02) 642 8970

- **Kenwood** TH-78A dual-band HT, current model. With 2 batts, 200 mems, mint cond, in box with manuals & chgr \$800. **Kenwood** TS-711A 2m & TS-811A 70cm all-mode base stations, EC. Ideal satellite xcvs 25W \$1100ea. Selling for overseas holiday. Steve VK2YUK (018) 60 1000. Licensed amateurs only.

- **Kenwood** TH-78A dualband FM HT, less than 1yr old, little use. As new cond. With orig manuals & carton \$700 ono. Tony, VK2XXZ (02) 521 5697. Licensed amateurs only.

- **Kenwood** TS-430S HF xcvr with hndbk, GC \$950. Written money back guar. **TET**-Emtron twin-el TE-23M beam 10/15/20m. Ideal for restricted area. 5x2m. \$200. Peter VK2FFA (043) 24 4160. Transmitting gear sold to licensed amateurs only.

- **Kenwood** TS-520S HF xcvr, with built-in CW filter, plus desk mic, MC-50, morse key,

dummy load, spare bottles, VGC, manual, orig carton \$500. **Tokyo Hy-Power** 200 ATU, manual, almost new \$200 ono. **Welz** 100W dummy load never used \$40. Joe, VK2KGT (02) 625 6193. Transmitting gear sold to licensed amateurs only.

- **Kenwood** TS-520S HF xcvr, with DG5 digital readout, MC-50 desk mic, manuals, all as new \$540. **Atlas** 210-X HF xcvr mobile 5-band, 100W, solid state, sim to FT-7B, mic, slide mount, very compact, manuals, as new \$350. **Yaesu** FRG-7700 digital comms rcvr with manual in carton faultless \$375. Eric, VK2AUG (044) 48 7118. Transmitting gear sold to licensed amateurs only.

- **Kenwood** TS-520S with manual & spare finals GC. Wes, VK2MUB (058) 81 2044. Licensed amateurs only.

- **Kenwood** TS-850S/AT HF xcvr \$3300, new with warr. **Yaesu** FP-757HD pwr supp \$475, as new **Icom** IC-229H 50W output 2m VHF FM xcvr \$450. James, VK2AJR (02) 622 6268, (02) 899 4214 fax. Transmitting gear sold to licensed amateurs only.

- **Prop-pitch** motor GC \$400

ONO. Lee VK2ANS (02) 349 5792

- **Six metres** cheap & easy! **Philips** 828 with complete inst circuits & kit of necc parts (not xtals) to convert to 6m. \$60 posted in VK. David VK2BDT (048) 21 5036. Licensed amateurs only.

- **Ten-Tec** Paragon HF xcvr with pwr supp, manuals, \$1500. Adrian, VK2ALF (064) 52 5555, fax (064) 52 4317. Licensed amateurs only.

- **Three**-element diamond quad mini-beam, 13ft boom, suit 6, 10, 15, 17, 20 metres. Exc cond, works well. US import. \$295. Andre, VK2FLY (063) 62 5123 or 68 2472

- **Uniden** HR-2510 10M mob xcvr 28-29.7MHz. \$300, no offers. Scott (018) 20 9470 A/H

- **Wanted:** all-band vert or 3-el triband minibeam. Mannie, VK2WMS (02) 489 6546

- **Wanted:** Guy rope, hvy duty, approx 125m, suitable for holding 14m tower. Malcolm, VK2BMS (02) 257 4583 B/H, (02) 958 1114 A/H

- **Wanted:** Tektronix 453A CRO for parts, or mains transformer to suit. Ph/fax (066) 72 1561 or write Robert Ward, VK2TAX, PO Box 378, Murwillumbah 2484

- **Wanted:** Tokyo Hy-Power HL-1K/6 6m linear or sim. Lee VK2ANS (02) 349 5792

- **Wanted:** Uniden HR-2510 or HR-2600, Icom IC-737A, Kenwood TS-450S/AT, Kenwood TS-950SD or TS-940SD, Yaesu FT-990AT. George, VK2NY (018) 47 0578, fax (044) 46 0625

- **Yaesu** FT-301 HF xcvr with 100W amp \$350. **Standard** C520 dual-band HT with extras \$700. George, VK2NY (018) 47 0578, fax (033) 46 0625. Licensed amateurs only.

- **Yaesu** FT-747GX HF xcvr with FM board & mob brckt, VGC, \$900 ono or swap for Icom IC-730 with transverter facilities with cash adj. Alan, VK2DXE (02) 552 2950. Licensed amateurs only.

- **Yaesu** FT-757GX xcvr HF xcvr \$800. **Yaesu** FC-757AT auto ATU \$280. **Yaesu** FP-757HD hvy duty pwr supp \$350. **Yaesu** FT-480 2m xcvr

### WEATHER FAX PROGRAMS

**RADFAX2** is a high-resolution shortwave weather fax receiving, displaying & printing program for the IBM XT or AT computer with a CGA, EGA, VGA or Hercules card (please state which). Programs are \$35 each plus \$3 postage, and are supplied on 5.25" or 3.5" disk (please state which) plus full documentation.

Programs are available only from Michael Delahunty, 42 Villiers St, New Farm Qld 4005. Ph (07) 358 2785.

Also **SATFAX** vers 5.1 (EGA & VGA) for \$45, and **MAX-ISAT** vers 2.2 (1024 X 768 X 16/256 SVGA) for \$75. These are weather satellite picture receiving & displaying programs. Please add \$3 P&H to all orders.



# ...CLASSIFIEDS...CLASSIFIEDS...CLASSIFIEDS...

\$300. Also antenna rotator \$200; grid dip meter \$80; 1kW lo-pass filter \$40; RTTY/Amtor to suit C-64 \$100. Keith VK2BK (043) 81 1844. Transmitting gear sold to licensed amateurs only.

• **Yaesu** FT-901D HF xcvr \$600. **Valves:** Brand new 4CX250Bs with VHF bases & chimneys \$125. Richard, VK2ERF (042) 96 9869. Licensed amateurs only.

• **Yaesu** FT-980 HF xcvr VGC c/w SP-980 filter spkr, svce manual, \$1600 ono. Alex, VK2GEO (015) 27 9414

## VK3 AREA

• **Accessories:** spkr/mic for the Yaesu FT-207R HT \$40. Jamie VK3FZ (054) 47 9400 Ah

• **Antenna** Werner Wulf 2M 'Dingo' in VGC \$60. David, VK3THY (03) 439 3649

• **Antennas** for short wave: wire dipoles with coax cable \$100ea. New long wire inverted vee dipoles \$120ea. Earth rods copper \$30ea with cable. Peter, (055) 72 1483

• **Deceased Estate VK3BRJ:** **Alinco** 720 plus 110/240 transformer, SSTV scan converter \$140. **MFJ** interface 1224 plus sftwre for C-64 \$35. Mrs Street (03) 726 4983

• **Hidaka** multiband trap VS-41/80KR vertical HF antenna 3.5-28MHz with 7MHz loading coil radial GC \$120. David, VK3DNG (03) 859 4698

• **Icom** IC-202 SSB xcvr inc mounting brckt \$200. **Yaesu** FNB-27 NiCd pack \$50. Roger, VK3XRS (051) 56 8291. Transmitting gear sold to licensed amateurs only.

• **Icom** IC-737 HF xcvr 6mths old EC \$2000. Pwr supp 20A 13.8V \$200. 20MHz dual chnl oscilloscope with 2 probes EC \$450. **Timewave** DSP-9 (2) filter \$300. Ray, VK3CDR (03) 726 9222. Transmitting gear sold to licensed amateurs only.

Please note  
that all  
phone  
numbers are  
after hours  
unless  
otherwise noted.

## QSL CARDS

QSL cards, white or colored, pre-printed or fully personalised with callsign, operator's name, QTH, station equipment, QSO panel, with or without logo, gloss or matte card. Top quality cards at best prices — 100 fully personalised cards for just \$19.50.

Send a 90 cent stamp to:

**BINT Services,  
PO Box 323,  
Cheltenham 3192**

for samples and price list.

• **Icom** IC-745 HF xcvr 100W with gen cov rx, with mic, elec keyer, manuals, orig pack \$895. Ken, VK3AKK (03) 634 9553 B/H. Licensed amateurs only.

• **Icom** IC-P2AT 2M HT, 100 mem chnls, artif intelligence, incl BP-110, dry cell batt pack, \$400, 1yr old. Paul (03) 572 1003 A/H (03) 541 6337 B/H. Licensed amateurs only.

• **Kenwood** TH-25A 2M HT & TH-45A 70cm HT, both with box, manual DC adaptr, chrgr, carry strap, belt clip, one spkr-mic, one batt case \$300 ea. \$550 for both. Joe, VK3FBA (03) 331 0517. Licensed amateurs only.

• **Magazines** *Amateur Radio* & *Amateur Radio Action* 1982-1986, a total of 83 issues — best offer. Stephen (03) 580 6418

• **MFJ** keyer & **Bench**

chrome paddle, little use \$200. Danny, VK3DNA (053) 34 2818

• **Phillips** FM-747, has Arthur's Seat, RMU & RMM repeaters, plus 439.25MHz simplex, \$110. Wenlock, VK3YWB (03) 464 0836. Licensed amateurs only.

• **Phillips** FM-828s 'E' model. Two remote head types \$50ea. One standard type \$30. G-model r/head type but xcvr only, no r/head \$30. Damien, VK3CDI (054) 27 3121. Licensed amateurs only.

• **Power supply:** 30A continuous, regulated, 13.6V fixed or 10-15V variable. Metered & cooling fan fitted, very solid construction \$300 ono. Harold, VK3AFQ (03) 596 2414

• **Satellite dish:** 1.6 metre pressed steel with ground

mount and all mounting hardware. New, never used \$230. Neil, VK3BCU (03) 390 2609

• **Tower** 40ft fully galv free-standing. Comes in three 20ft sections. \$450 ono. Lyndon, VK3LSM (053) 33 1054

• **Tower** 100ft Hills triangular section crank up telescopic design consisting of four sections. Also incl is a bundle of guy wires, missing base plate, in EC. A fraction of new price \$500 ono. George, VK3YSU (03) 428 0140

• **Various:** Two metre FM amp 40W with preamp \$100. Epson LX-400 printer new \$199. Yaesu scanning mic new \$50 Jack, VK3EK (03) 386 2795

• **Various:** VHF 100W 6M & 2M valve linear amp with pwr supp \$80. HF 120W linear amp link coupled on 20m \$100. HF 1kW linear (280 813s in grounded grid) with built in ATU & pwr supp \$300. Valve volt meter type Airmee type 314 \$30. Computer (280 CPU) with disk drive \$30. Heathkit 2M & 6M receiving converters with pwr supp \$40 the pair. Two large Hi-Fi spkr boxes with spkrs \$20ea. Anthony VK3JIA (03) 720 2234. Transmitting gear sold to licensed amateurs only.

• **Wanted:** Marconi T-1154 transmitter, prefer going or restorable, for new Australian National Museum of Aeronautics and Space located at Point Cook. If you can help please contact Allan Doble VK3AMD (03) 570 4610 or Arthur Evans VK3VQ (03) 598 4262s

• **Wanted:** Solid-state ATV xmtr for ATV group, GRES Geelong, pref the one from VK3ZJY's book 'Building an ATV TX'. Bill, VK3BWS (052) 29 3337 or Joe, (052) 21 3125

• **Wanted:** Tiny-2 TNC (1200 baud) required urgently for repeater project GC reas price. Bryan, VK3FBC (057) 75 1628

• **Wanted:** Valve tester in

## ANTENNA WEST

• **COMMERCIAL, CB, SCANNER & AMATEUR**  
• **ANTENNAS NATIONWIDE**

GEM QUAD 4 BAND HF QUADS

FOR 23 YEARS THE BEST HF QUAD, IN STOCK NOW.

HIGH GAIN ANTENNAS FOR 2 MTRES & 70 CMS AVAILABLE  
CROSSED YAGI'S FOR 2 & 70 SATELLITE COMMUNICATIONS  
EVOLVING COMMS SCANNER SOFTWARE INCLUDING HAM & CB CALLBOOKS ON DISC, AND A WHOLE LOT MORE IN STOCK.

SO MANY ANTENNAS TO CHOOSE FROM,

SO LITTLE SPACE TO LIST THEM ALL!!

**RING KEITH BAINBRIDGE  
FOR DETAILS**

**ON (09) 279 4923 or (015) 198 362**

4 NORTHMOOR ROAD, EDEN HILLWA 6054  
CALLERS BY APPOINTMENT PLEASE.  
ALL PRICES PLUS FREIGHT EX PERTH

L 086.ARA

## QSL CARD COLLECTION

Please make donations of QSL cards to the Wireless Institute of Australia QSL collection and save something for the future. Also, if helping a silent key estate, please contact Ken, VK3TL, 4 Sunrise Hill Rd, Montrose 3765, or phone (03) 728 5350. Arrangements can be made for large quantities of cards.

Please do NOT  
quote PO Box  
numbers  
without supplying  
your full  
residential address.  
This is the LAW.



# ..CLASSIFIEDS...CLASSIFIEDS...CLASSIFIEDS...

VGC. Also Emtron EAT-300A ant tuner in VGC. David, VK3THY (03) 439 3649

• **Yaesu** FT-101B with CW filter, ext VFO & spkr, 3 extra valve sets, hndbk & svce manual \$450. Allen, VK3SM (03) 386 4406. Licensed amateurs only.

• **Yaesu** FT-101ZD HF xcvr, 100W output, comp with desk mic YD-148 & workshop manual EC \$575. Don, VK3DYH (03) 802 2528

• **Yaesu** FT-107M HF xcvr with built-in pwr supp plus Yaesu FV-1010M ext VFO. Both units EC \$800. Barry, VK3JAB after 6pm Will not sep. (03) 850 7580. Licensed amateurs only.

• **Yaesu** FT-211RH 2m FM xcvr \$300. **Yaesu** FT-102 HF xcvr \$700. **Hy-Gain** 3-el tribander, \$100. Ron, (054) 39 7488. Transmitting gear sold to licensed amateurs only.

• **Yaesu** FT-23R 2M HT, 10ch mem & scan, PA-6 DC adptr chrgr, FBA-17 dry cell case with 500mA NiCd's, spare FBA-17 case, mint cond \$400 ono. VK3YTT (051) 34 4275. Licensed amateurs only.

• **Yaesu** FT-290R 2M all-mode with vinyl case & mobile brckt \$350. **Johnson Viking** 352D CB converted to 10m \$100. Mark, VK3JMD (03) 558 2959. Licensed amateurs only.

• **Yaesu** FT-690R MkII 6m xcvr with integral 10w amp & mob cradle \$650. Damien VK3CDI (054) 27 3121. Licensed amateurs only.

• **Yaesu** FT-7 HF xcvr, orig carton & manual, ideal for Novice \$400. Marine satellite navigation unit (not GPS) with ant \$150. Noel, VK3MHD (03) 859 9455. Transmitting gear sold to licensed amateurs only.

## VK4AREA

• **Apple** Macintosh computer LCIII, 12MB RAM, 80MB hard disk, Macintosh color display, extended kybrd, mouse, cables, 7.1 system swtware, all reference manuals VGC \$2100. Ian, VK4LMD (077) 21 1236

• **Icom** IC-271H 100W all-mode 2m xcvr \$1150. **Icom** IC-2GAT HT, NiCd chrgr, \$325. **Yaesu** FT-23R HT, stand chrgr \$325. VK4KL (07) 824 0897. Licensed amateurs

only.

• **Icom** IC-751A HF xcvr \$1700. **Icom** AT-500 ATU \$900. **Icom** PS-30 pwr supply \$450. **Icom** SP-3 spkr \$90. **Icom** IC-2KL HF amp \$2700 all in EC with orig manuals, prices ono. Lou, VK4ATX (074) 98 2152. Transmitting gear sold to licensed amateurs only.

• **Standard** C-528 VHF-UHF HT with tone board, spare batt pack, chrgr \$700 ono. **Kenwood** TM-221A 2M FM xcvr, like new \$475. David, VK4VUZ (07) 204 2635. Licensed amateurs only.

• **Tower** 40ft tilt-over medium duty, VHF/UHF ideal, counter-balanced, three sections 375. **Icom** IC-02A 2M HT EC 5W out, \$275. David, VK4DH (07) 274 2155 B/H, (07) 378 9868 A/H

• **TVRO** satellite rcvr Winnersat WR-8000, 99 mems, variable IF&AF bandwidth, top-line equipment \$450. WRAASE prof weather satellite rcvr & image display/storage unit \$2200. John, VK4JWT (077) 21 3249

• **Wanted:** All-mode dual or triband xcvr 2m/70cm 23cm optional. Prefer Kenwood TS-790 or sim. Ray, VK4TFT (070) 51 3837 B/H. Licensed amateurs only.

• **Wanted:** Cavity filters, 2M, suit repeater, our requirement two but prefer four, contact Secretary **HBARC** Inc. PO Box 829, Hervey Bay 4655 (071) 25 1332

• **Yaesu** FT-101E HF xcvr, GC, rcvr needs peaking, transmitter okay, no mic, (was 'borrowed' permanently!), manual \$300 ono. Ken, VK4MKP (074) 44 5120

## VK5 AREA

• **Antenna** 8-el log periodic 15ft boom, 19-30MHz \$450 plus freight — a very popular antenna. **Daiwa** CNW-418 ATU, 500 W PEP rating, \$230

plus freight. Offers will be considered. Paul, VK5MAP (086) 51 2398

• **Magazines:** **AR** mags Vol 46-60 (1972-92) in qual vinyl binders. Also **ARA** mags Vol.1-14 1978-92. Any reas offer. Laurie, VK5FH (085) 56 2253

• **Wanted:** C64 mode decoder suitable for RTTY, CW, SSTV. Must work well. Reas offers considered. Simon, VK5VST (087) 33 4435

• **Yaesu** FT-200 HF xcvr, GC with pwr supp \$320 ono. Neil, VK5ANF (085) 82 1270, LAO

• **Yaesu** FT-990 HF base xcvr, brand new, sell or swap for VHF/UHF xcvr FT-736R with 6m/2m/70cm or sim, as new.

Also new interface Yaesu FIF-232C \$150. New 386SX25 motherboard \$160. KX-P1-91 National 9 pin printer \$160. Plotter Tektronix model 4662 \$200. Luis, VK5ZBJ (08) 250 6394. Transmitting gear sold to licensed amateurs only.

## VK6 AREA

• **Kenwood** TM-241A 2m FM xcvr, plus **Diamond** F-23A 2m antenna. Both in new cond. \$575 the lot. Alex, VK6PCI (097) 39 1174. Licensed amateurs only.

• **Kenwood** TS-940S HF xcvr with int ATU & pwr supp, orig box and pack, manual & mic, as new \$2600. John, VK6AJW (09) 397 6944. Licensed amateurs only.

• **Wanted:** by collector: Heathkit gear manuals, cats & amateur equip & anything pertaining to Heathkit. Bryce, VK6KBE (09) 349 9489

## VK7 AREA

• **Mirage** B-1016G 2m linear amp, as new, 10W in 160W out \$425. Phil, VK7KPM (002) 65 9465. Licensed amateurs only.

## VK8 AREA

• **Phillips** FM-828 W1 band 470-490 MHz, suit CB repeater GC \$150 ono. Trevor, VK8CO (089) 45 3373

• **Satellite DX** Super rx 2000 digital rcvr. Threshold 2.5 dB also digital picture, sound, synchron resolution processor. Mobile DC rcvr. Pay TV decoder, TV/radio picture/sound modulator. All new. Send \$5 for specifications to cover cost. John Papp, PO Box 472, Sanderson NT 0812. (089) 27 4985 voice or fax.

## VK9 AREA

• **Icom** IC-751 HF xcvr, gen cov rcvr, built-in int pwr supp. **ARA** PK-232MBX multi-mode TNC with wefax and other software. **NEC** CQ-301 HF linear amp (very sim to Kenwood TL-922). Needs two 3-500Z tubes (not supplied). Does not have WARC bands, but is well-built and lethal! Not for the appliance operator. The price is right... **Cushcraft** 3-el HF beam. Also: set of genuine JA TET traps for multi-element beam — build your own tribander! Several **rotators**. New KSR606, used KR100SDX, used KR400, a rebuilt HAM 'M' with latest parts fitted (steel drive ring, new mod brake wedge and brake housing). Note there is no indicator with this one. Anyone with a broken Emotator 1103 please call me. **Linear** amplifier parts: blower, hypersil transformer, several vacuum vars, tube sockets, HV caps etc. Write, fax or phone: Jim Smith, VK9NS phone 0011 6723 22437, fax 0015 6723 22259, or write PO Box 90, Norfolk Island, NSW 2899. Transmitting gear sold to licensed amateurs only.

### PACKET RADIO

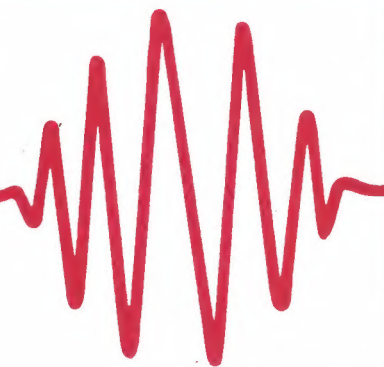
**Baycom** modems ass/tested \$85. **Baycom** kits \$65. **Baycom** PCB \$15. **JV FAX** demodulators ass/tested \$25. **JV FAX** DCB \$15. Post & pack \$3.50 per item. Bankcard or cheques welcome. Same day dispatch. Kevin Cavanagh, 222 Brisbane Valley Highway, Wanora, Ipswich QLD, 4306. Phone voice or fax (074) 64 3954

## PACTOR

**BMKMULY** A multi-mode program for IBM PCs and clones. No data controller required. Modes available: PacTOR \$110, Amtor \$60, RTTY, CW, FAX, SSTV \$30 each. Discounts for multiple combinations. New 6-band F dipole. Ideal for small yards, rotatable. Send for details to Dave Ralph, VK4ASB, PO Box 2198, Chermiside Centre 4032. Phone (07) 865 1537 (AH).



# amateur radio action



Readers of **Amateur Radio Action** may use the **ARA CLASSIFIEDS** column to the extent of 25 words absolutely free! This offer applies only to private "For Sale" or "Wanted" classified listings, and to computers, software or computer peripherals with an amateur application. A **limit of one classified** advertisement applies to each advertiser. Any additional words **must be paid for or the advertisement will not be accepted.**

A nominal fee of \$4 per additional 25 words or part thereof will apply. This fee should accompany your material. Please enclose this fee or your advertisement will not appear. Preference is given to paid advertisements, and we receive an awful lot of them each month.

Your advertisement's inclusion **cannot be guaranteed**, but every effort will be made to place your advertisement in the issue following receipt of copy. The 25 words must include your name, callsign and phone number. The publisher reserves the right to amend or reject any advertising material considered unsuitable for publication.

No correspondence will be entered into.

Repeat **ARA CLASSIFIEDS** advertisements will be accepted for a fee of \$4 for every 25 words - including the first 25.

Once again, this fee should accompany your material.

Free advertisements for **commercial goods or services** will not be accepted for publication in these classifieds pages. Instead, special rates

apply for commercial advertising material which appears in the display pages of **Amateur Radio Action**.

For details of display advertising phone Ian Dale on (03) 601 4209

Readers should note that all advertisements are required to comply with the provisions of the Victorian Consumer Affairs Act of 1972. They should be aware that, under the above Act, Post Office box numbers can be published **only if the full name and residential address** of the box holder is supplied with the advertising material.

This form is to be used for all classified advertising material in **Amateur Radio Action**. Letters on plain paper requesting the insertion of a classified advertisement will not be accepted. Photocopy or clip this form and post it complete to:

**Amateur Radio Action Classifieds**

**GPO Box 628E**

**Melbourne 3001**

**IMPORTANT NOTICE:** Unsuitable material includes unsigned advertisements for wanted amateur transmitting equipment where no call sign is shown, sale equipment modified for general coverage transmit, non-amateur transmitting equipment (including CBs) or equipment modified for use on CB, marine or other non-amateur bands.

You may fax your classified to (03) 670 9096 only if under 25 words

**Next issue's deadline:** Please feel free to send us a photocopy of this form, but, it must be a copy of the full page - not just the form.

**Also please note, as these classifieds are keyed in by a typist who doesn't know a linear amp from a TH3, please ensure that your writing is legible to someone other than you! If it's not, it is likely to not be run.**

|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

FREE

PAY  
\$4

FREE

PAY  
\$4

NOT FOR PUBLICATION, BUT THIS SECTION **MUST** BE COMPLETED

Your name: \_\_\_\_\_

Call sign (if any): **VK**

Residential address: \_\_\_\_\_

Phone contact\*: ( ) /

Your signature: \_\_\_\_\_

Today's date: / /

\* This number is for the editor's use only - to check any details. A **business hours** number please. **NOT** for publication!



# DAYCOM

## Australia's Amateur Radio SUPERSTORE!

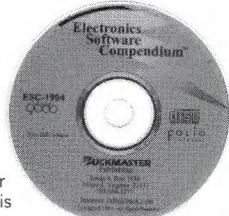
Electronics Software Compendium  
1000's of programmes  
on a disk!

**\$45**

including postage  
"Possibly the best

collection of shareware for  
amateurs ever collected" is  
how one amateur who saw  
this CD-ROM described it — and he wasn't kidding!  
Hundreds of megabytes of high quality programmes  
for all aspects of electronics and amateur radio.

Complete with easy search capability and  
convenient unarchiving system.



**BUCKMASTER**

HamCall CD-ROM  
April 1994  
U.S. and Interna-  
tional Call Book

**\$75**

including postage

For the most complete electronically accessible  
callbook listings available this is the product you need!  
HAMCALL has 101 countries (including USA & Canada)  
on a single CD-ROM disk.

This collection is accessible directly from log  
programmes such as Ham-Windows and can also be  
used with a variety of BBS systems.

Australia not included in this edition.

### Kenwood specials!



|           |                         |        |
|-----------|-------------------------|--------|
| TS-50S    | 100W HF mobile          | \$1600 |
| TS-60S    | 90W 6mtr NEW!           | \$1940 |
| TS-450SAT | 100W HF with ATU        | \$2400 |
| TS-690S   | 100W HF+50W 6 mtr       | \$2400 |
| TM-251A   | 2mtr 50W, 9600bps ready | \$799  |

### Icom specials!



|         |  |        |
|---------|--|--------|
| IC-728  | 100W HF 26 memories  | \$1800 |
| IC-736  | 100W HF+6m, int PS&ATU   | \$3600 |
| IC-738  | NEW! HF 100W w ATU   | \$2700 |
| IC-820H | 2m/70cm SSB, CW, FM,<br>45/40W with 9600bps including<br>cross band FDX& satellite | \$3300 |
| IC-820H | with KPC-9612, cabled,<br>configured & tested together!                            | \$3800 |

### The Packet Radio Store!



|          |   |       |
|----------|---|-------|
| KPC-3    | Low power VHF packet                                    | \$279 |
| KPC-9612 | NEW! 9600bps and 1200bps<br>Dual port packet, low power | \$535 |
| KAM-Plus | High performance all-mode                               | \$729 |
| MFJ1270B | Basic packet controller                                 | \$259 |

|           |  |       |
|-----------|--|-------|
| MFJ1270BT | Basic packet with 2400bps                    | \$429 |
| MFJ1276   | HF/VHF packet and HF Packet                  | \$349 |
| MFJ1278B  | Multi-mode controller                        | \$649 |
| MFJ1278BT | Multi-mode with 2400bps                      | \$839 |
| MFJ2400   | 2400bps modem for TNC-2                      | \$199 |
| MFJ2400X  | 2400bps for PK-232                           | \$199 |
| MFJ9600   | 9600bps modem for TNC-2                      | \$245 |
| DPK-2     | TNC-2 basic packet                           | \$259 |
| DPK-9600  | 4k8/9k6/19k2 high speed<br>packet controller | \$459 |

### Australian Callbook now on disk!

Now, for the first time the complete listing of  
Australian amateur licensees is available on disk.  
Complete with access software which enables searches  
by name, street or postcode also enables you to edit  
the database to include your own up-to-date  
information. For IBM-PC or compatible with hard-disk.  
Supplied on 3.5" high density floppy disk.

**\$32.50**

including postage

## Butternut is back!

Not an imitation, but the real thing! And where would you expect to find a quality antenna like Butternut? Why at  
DAYCOM of course! The entire Butternut range of antennas is now **IN STOCK** ready for immediate delivery from DAYCOM.  
Call for more details, or to place your order.

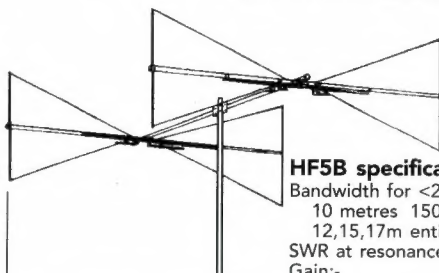
#### HF6V-X specifications:

Bandwidth for < 2:1 SWR:-  
10 metres 1500 KHz  
15 metres entire band  
20 metres entire band  
30 metres entire band  
40 metres 280 KHz  
80/75 m. 40 to 100 KHz

#### HF9V-X specifications:

Bandwidth for < 2:1 SWR:-  
6 metres 1MHz  
10 metres 1500 KHz  
12 metres 200kHz  
15 metres entire band  
17 metres 200kHz  
20 metres entire band  
30 metres entire band  
40 metres 280 KHz  
80/75 m. 40 to 100 KHz

SWR at resonance: ≤1.5:1  
Power handling: 1.5kW  
Feed impedance: 50Ω  
Wind load: .49m<sup>2</sup>  
Wind survival: 129kph  
Height: 7.9m  
Weight (HF6VX) 5.4kg



#### HF5B specifications:

Bandwidth for <2:1 VSWR:-  
10 metres 1500kHz  
12,15,17m entire band  
SWR at resonance: ≤1.5:1  
Gain:-

|                      |       |
|----------------------|-------|
| 10 metres            | 5dBd  |
| 12 metres            | 5dBd  |
| 15 metres            | 5dBd  |
| 17 metres            | 0dBd  |
| 20 metres            | 3dBd  |
| Front to back ratio: | 20dB  |
| Front to side ratio: | 30dB  |
| Power handling:      | 1kW   |
| Feed impedance:      | 50Ω   |
| Wingspan:            | 3.84m |
| Boom length:         | 1.83m |
| Turning radius:      | 2.12m |
| Vertical spreaders:  | 1.83m |

For gain where you really  
didn't think it was possible! The  
BUTTERNUT HF5B "Butterfly"  
beam is designed for those lo-  
cations where just about any  
other rotatable antenna won't  
fit. This compact beam uses no  
messy traps and can be turned  
with a small rotator. High qual-  
ity stainless stell hardware is  
used throughout to ensure your  
HF5B will last.

For many years the Butternut company has  
been famous for producing high quality  
antennas that **REALLY WORK!** The entire  
Butternut range is now on stock at Daycom for  
immediate delivery. If you are short of space,  
or just want to join the thousands of satisfied  
amateurs using a Butternut then call us now!

|            |                                |          |
|------------|--------------------------------|----------|
| BN-HF2V    | 2 band vertical 80 & 40m       | \$400.00 |
| BN-30MRK   | 30m kit for HF-2V              | \$100.00 |
| BN-TLK     | Top loading kit for HF-2V      | \$48.00  |
| BN-TBR160S | 160m option kit                | \$160.00 |
| BN-HF6VX   | 6 band 80-10m vertical         | \$423.00 |
| BN-HF9VX   | 9 band 80-6m vertical          | \$523.00 |
| BN-A1712   | 17/12m add-on (HF6VX)          | \$100.00 |
| BN-A6      | 6m add-on (HF6VX)              | \$30.50  |
| BN-TBR160S | 160m add-on (either)           | \$160.00 |
| BN-CPK     | Counterpoise kit (either)      | \$110.00 |
| BN-STR2    | Stub tuned radial kit (either) | \$100.00 |
| BN-RMK2    | Roof mount kit (either)        | \$155.00 |
| BN-HF5B    | 5 band 20-10m mini-beam        | \$650.00 |

DAYCOM COMMUNICATIONS Pty. Ltd.  
**37A Fenton Street, Huntingdale 3166**

Bankcard, MasterCard  
& Visa all welcome

Phone (03)543-6444  
FAX (03)543-7238

Copyright © 1994 Daycom Communications Pty. Ltd. All rights reserved. Prices do not include freight or insurance, are subject to change without notice and are valid during month of publication only. ACN 061 819 949



ICOM

Count on us!



## Power and Performance goes slimline.

It's remarkable! Icom innovation means our radios keep getting sleeker and slimmer but you get all the power you need.

Our latest units are great space savers yet are packed with real communications punch.

As Icom's Duncan Baxter, VK 3LZ, says...only the sizes have been reduced, not the performance.

Whatever your requirements, from handheld to HF there'll be an Icom model to suit your needs exactly.

Call Duncan and the Icom team for a brochure or the name of your nearest dealer.

Icom Australia 7 Duke Street Windsor Victoria 3181

Free Call : (008) 338 915 Ph : (03) 529 7582 Fax : (03) 529 8485 A.C.N. 006 092 575



IC-2340H



IC-7300



IC-7300